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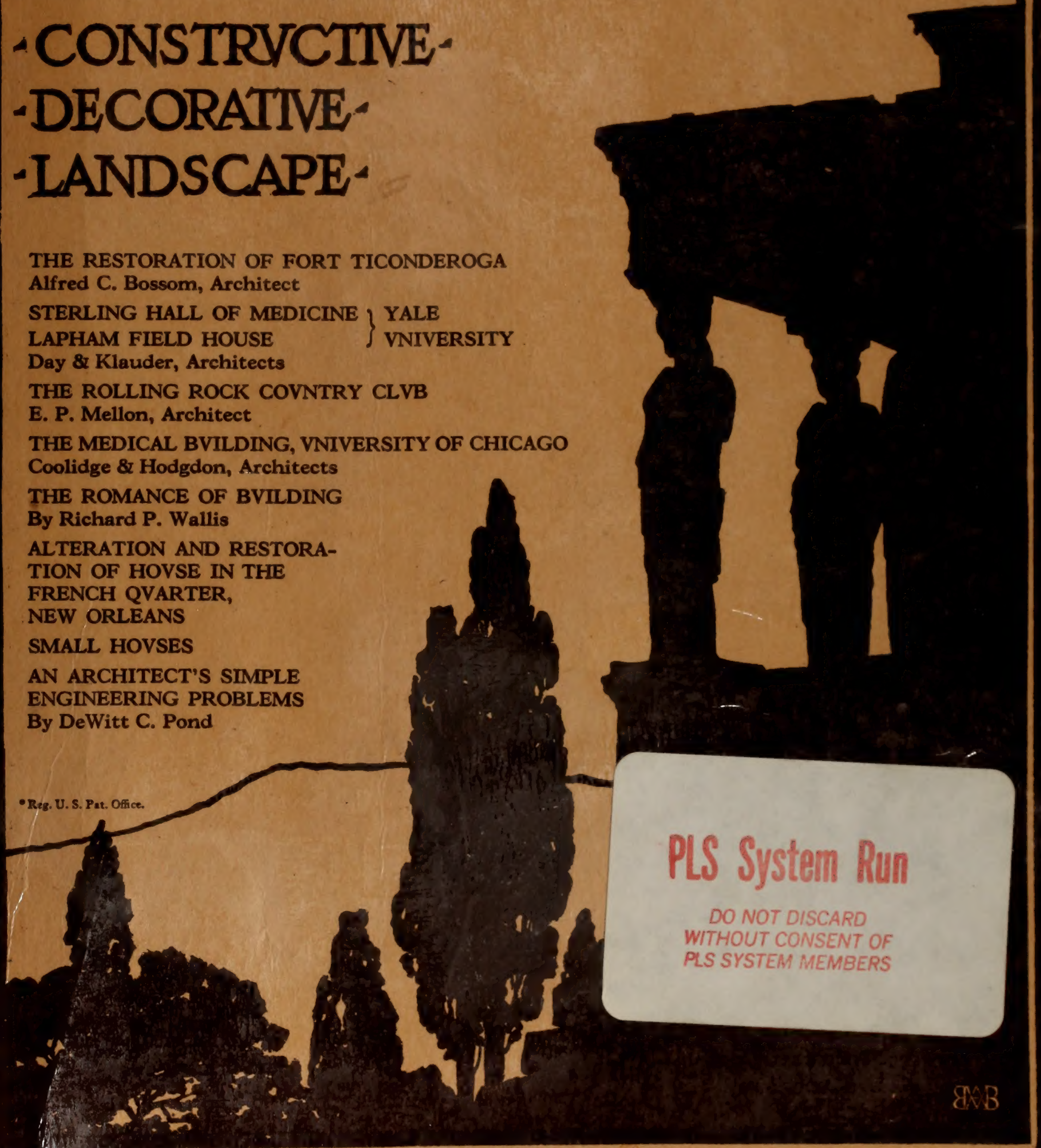

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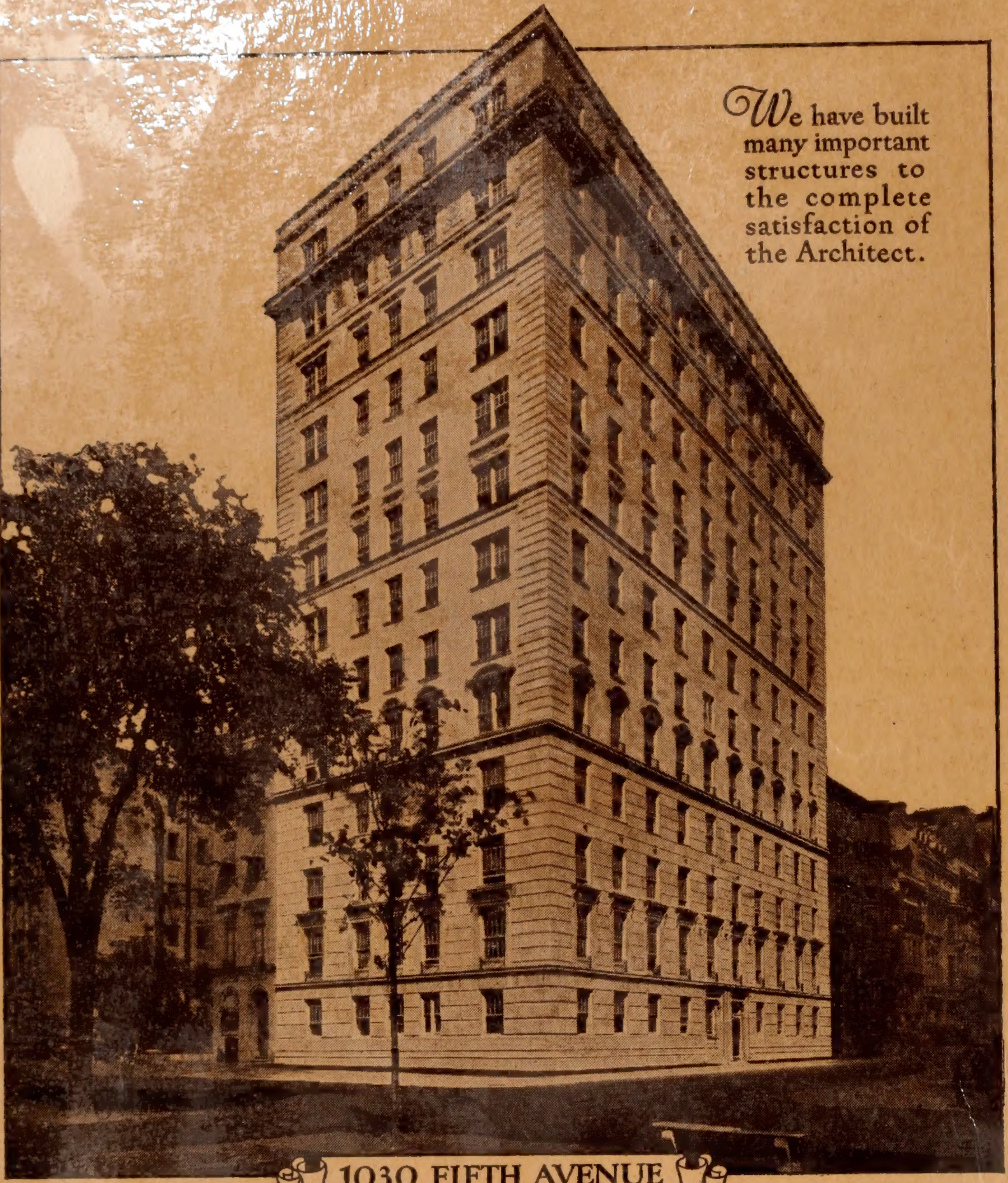

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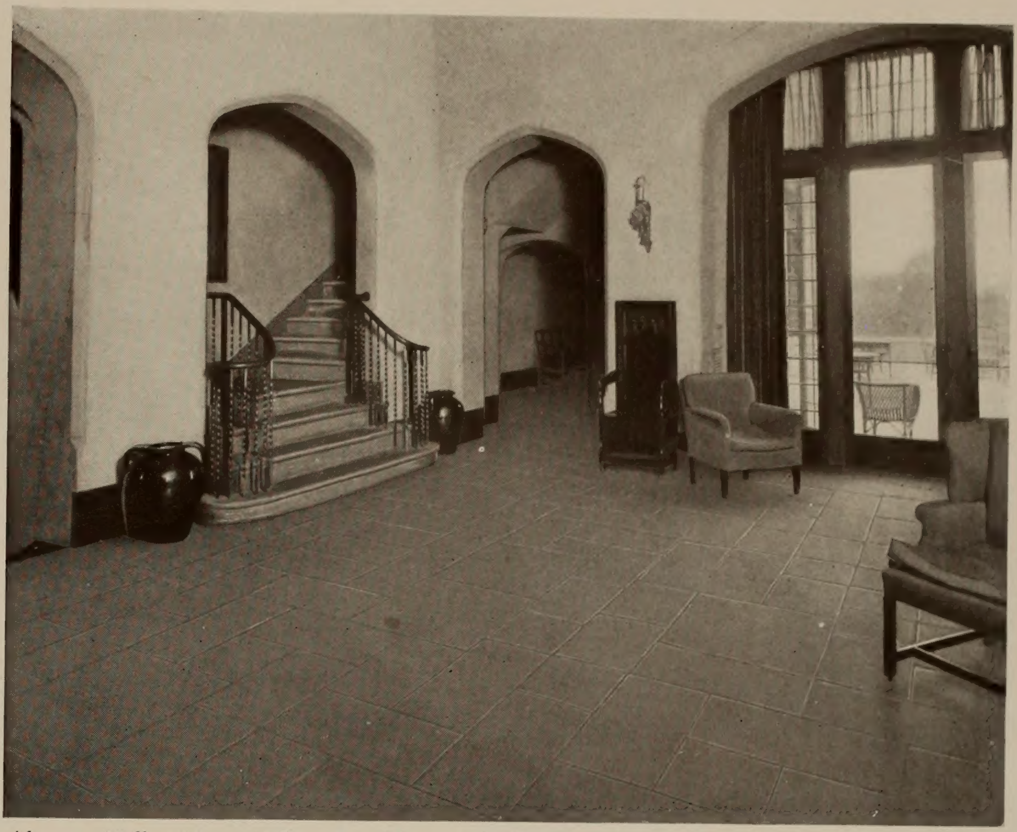

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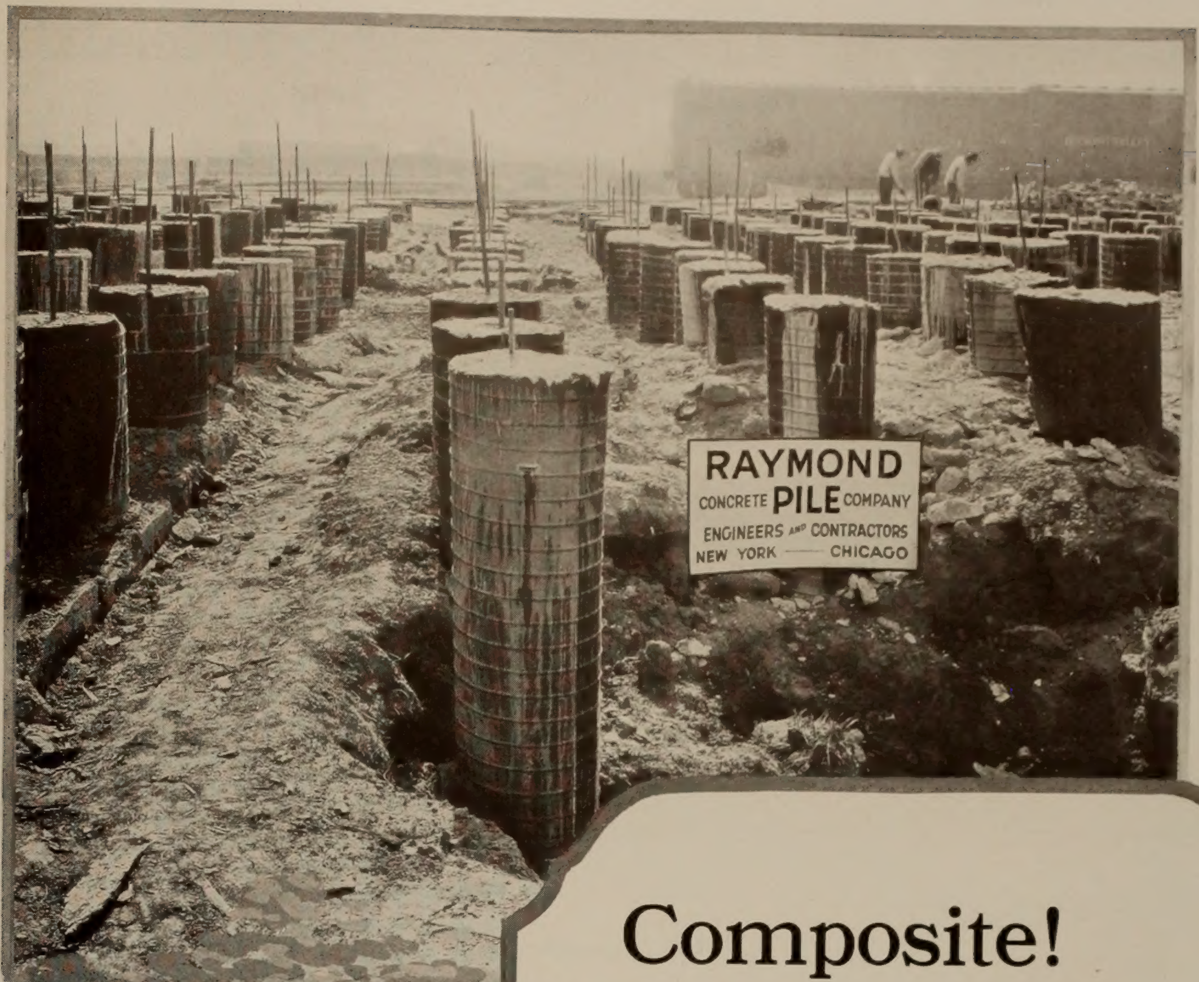

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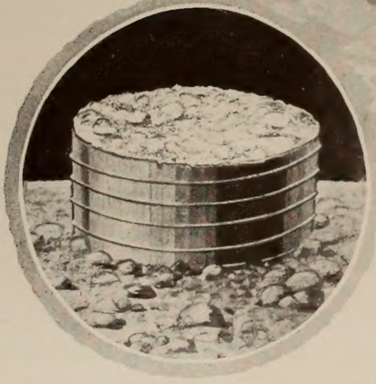

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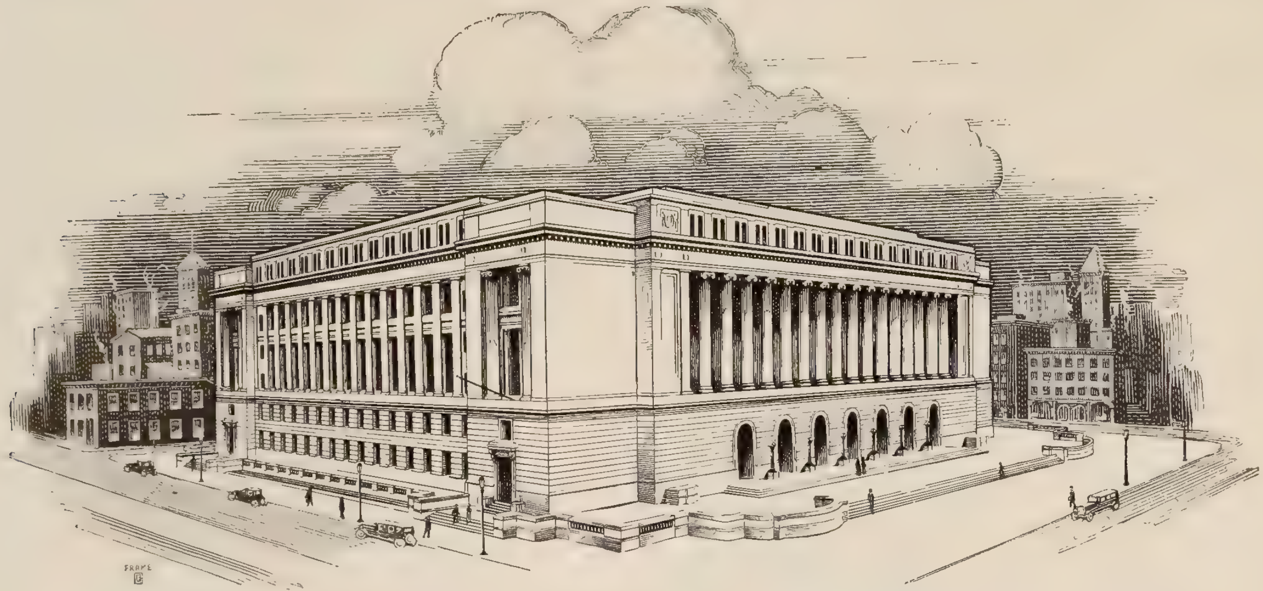

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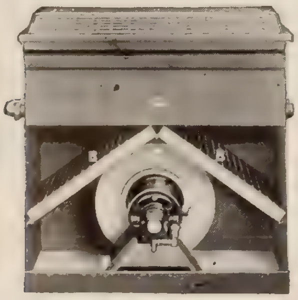

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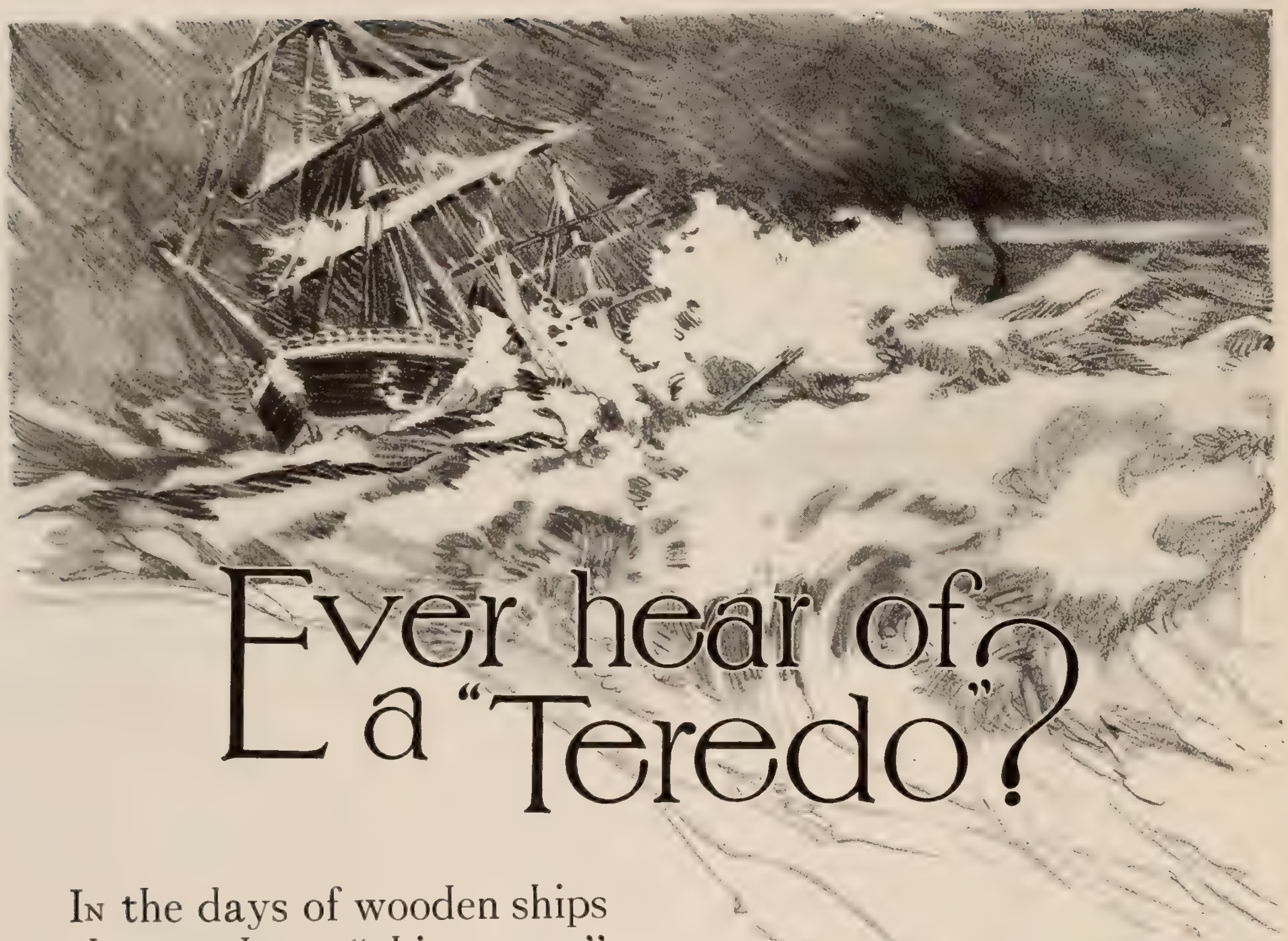

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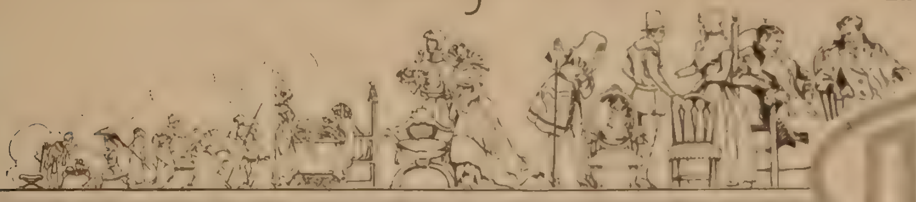

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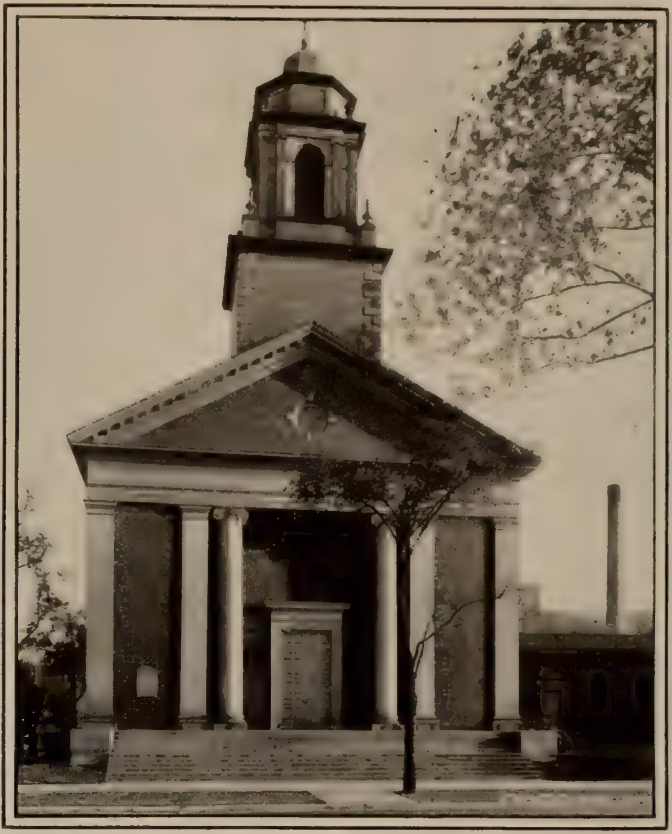

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THEY add one more artistic finish to the many available in H&H Plates. And they fit in well with the harmonies of fine architecture.

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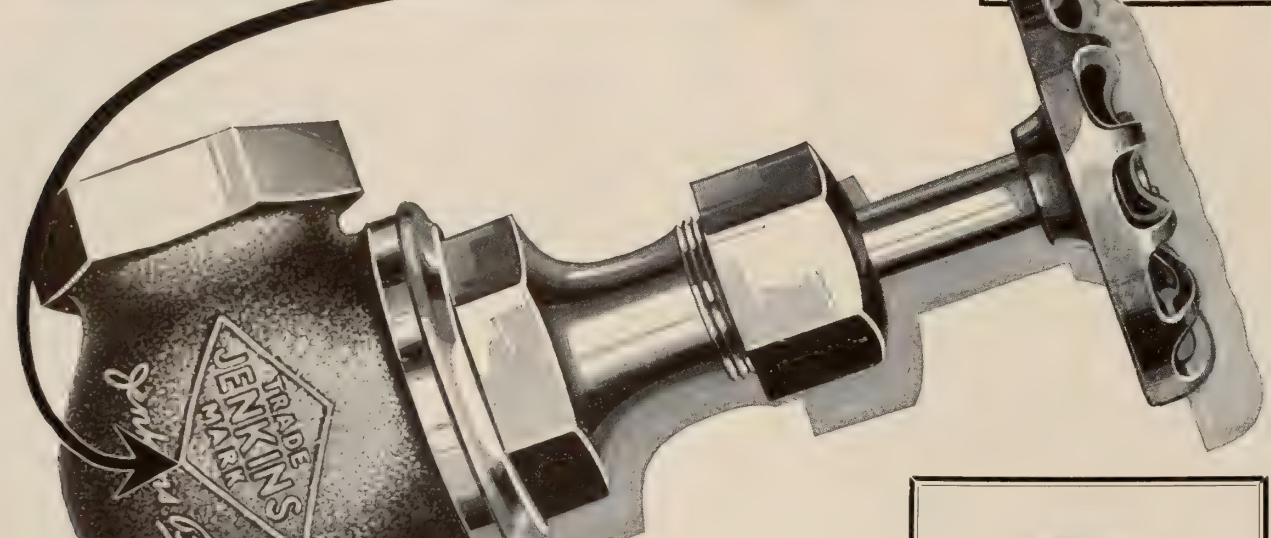

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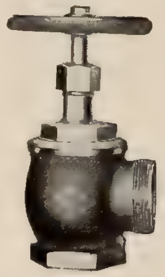

Fig. 715
Jenkins Bronze Fire Line Angle Valve

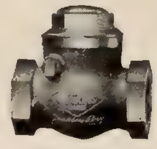

Fig. 352
Screwed Jenkins Standard Bronze Swing Check Valve

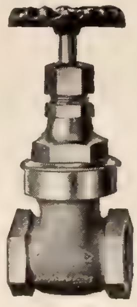

Fig. 370
Screwed Standard Bronze Gate Valve

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Better Doors mean Better Refrigeration

IN this large five-story beef and pork packing plant, Jamison Doors have made a record worth talking about. Following the Pueblo flood of 1921, G. H. Nuckolls, President of the Company, wrote us:

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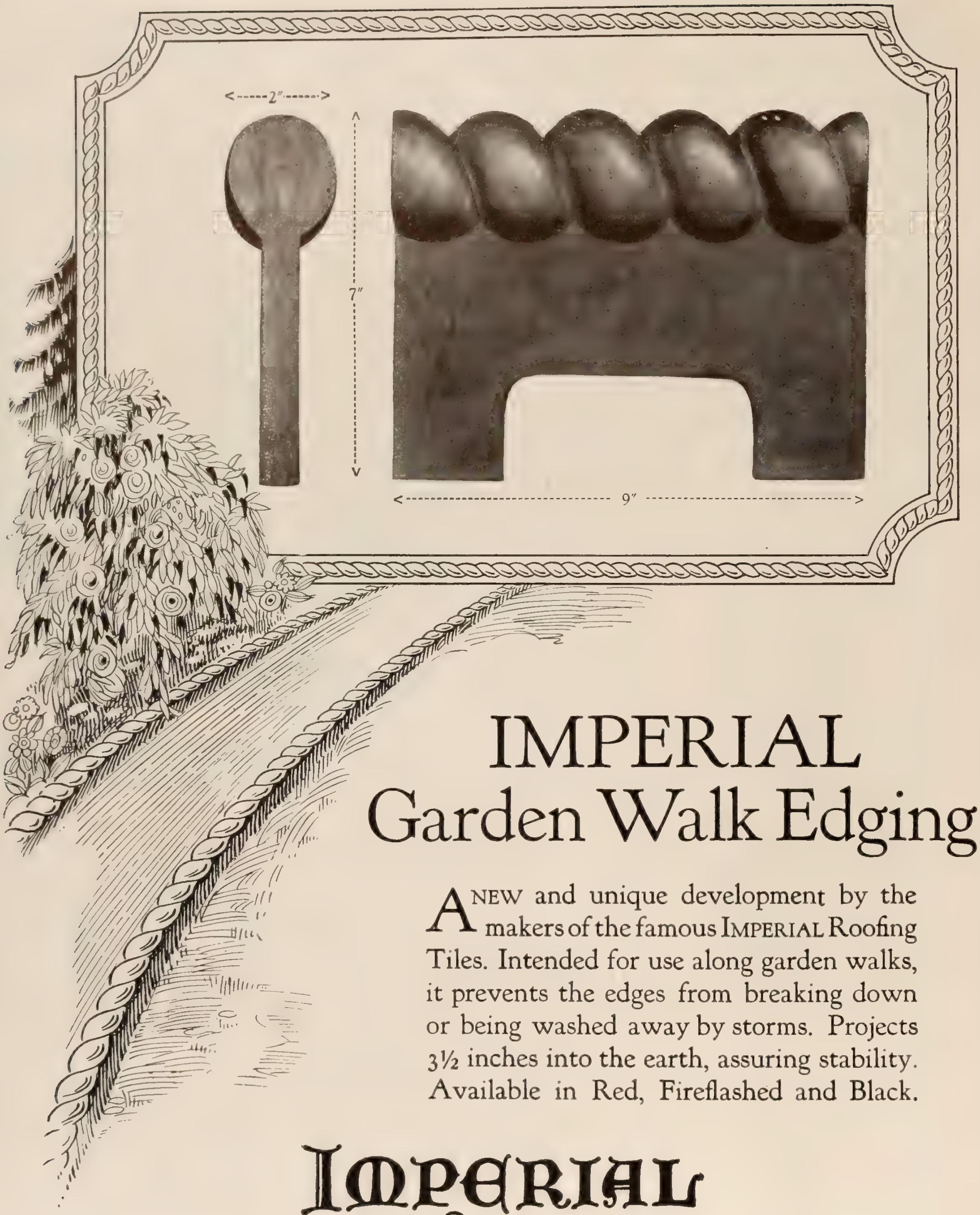

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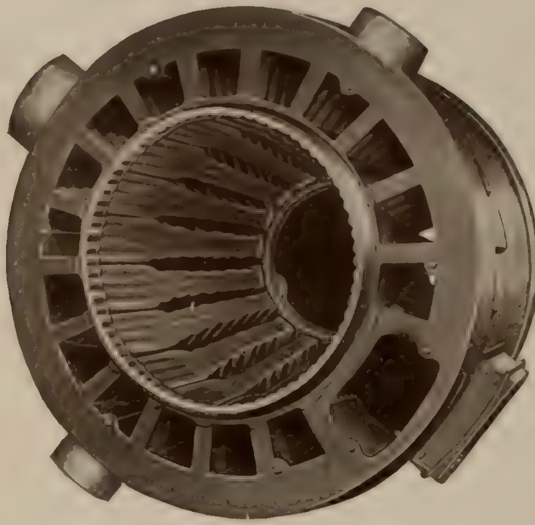
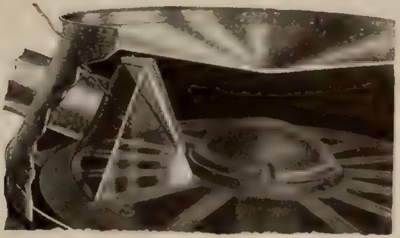


The Kelsey Warms That "*Hard-to-Heat*" Room



Here's How It Does It

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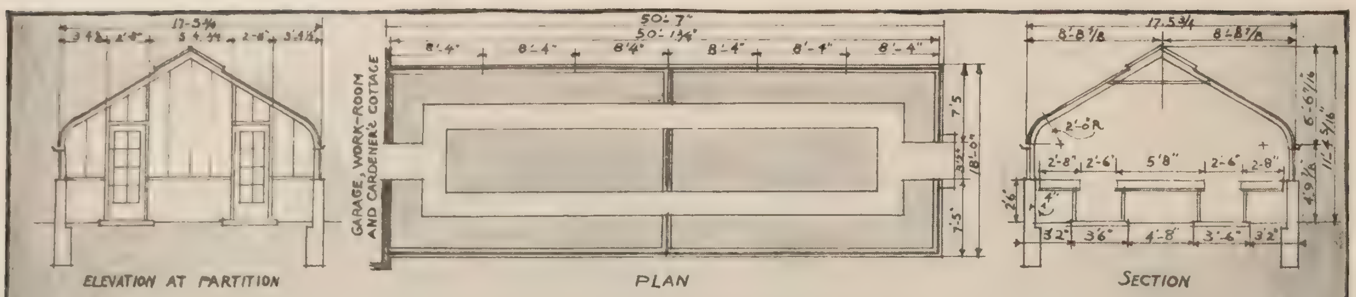

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Second, there's the economy of operation, as the gardener is handy-by to give his attention to the needs of varying ventilation and heat.

Third, the one heating plant with its Burnham Boiler can with a considerable saving in coal, heat the entire layout.

This subject was erected for C. S. Stevens, Larchmont, N. Y. Walker & Gillette, Architects.

This is Number Five of a series of studies, each done in lithograph by Vahan Hagopian. Every six months, reprints of the preceding studies will be mailed to all who send us their name.

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Cement fillings in trees are like dentistry

In the treatment of a cavity in a tooth, the dentist must do at least three things. First, he must clean out all the decay and prevent further decay. Second, he must prepare the cavity so that the filling will stay permanently in place. Third, he must exclude all foreign substance, especially moisture.

The Tree Surgeon must do all of these things and more. He must contend with the swaying and twisting of the trees in the terrific winds. Therefore, Davey Tree Surgeons build their cement fillings in sections, like the backbone in the human body, to allow for this sway and to prevent cracking and breaking. This sectional filling method is a patented process, used exclusively by Davey Tree Surgeons, and is the one thing that made successful Tree Surgery possible.

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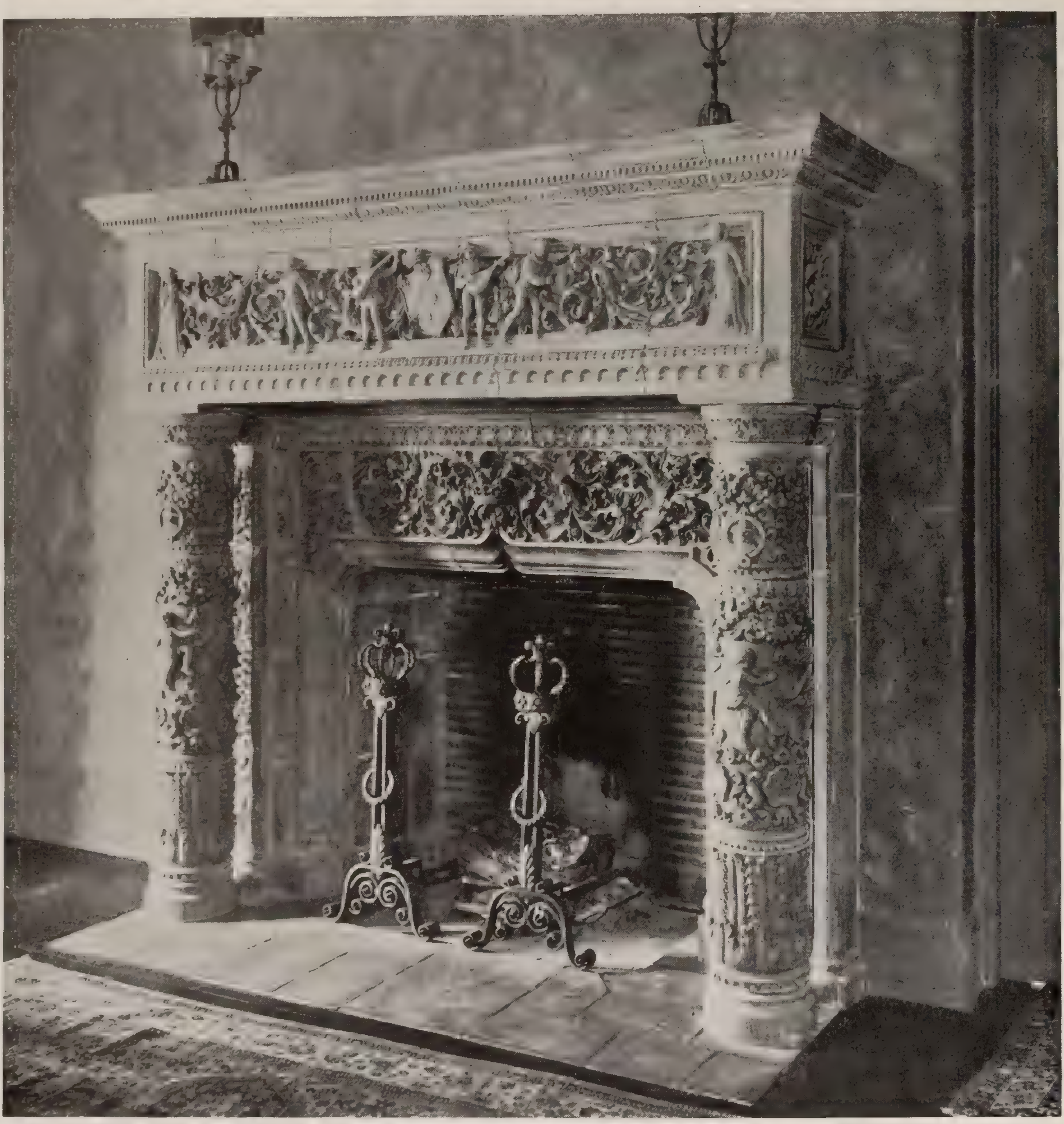

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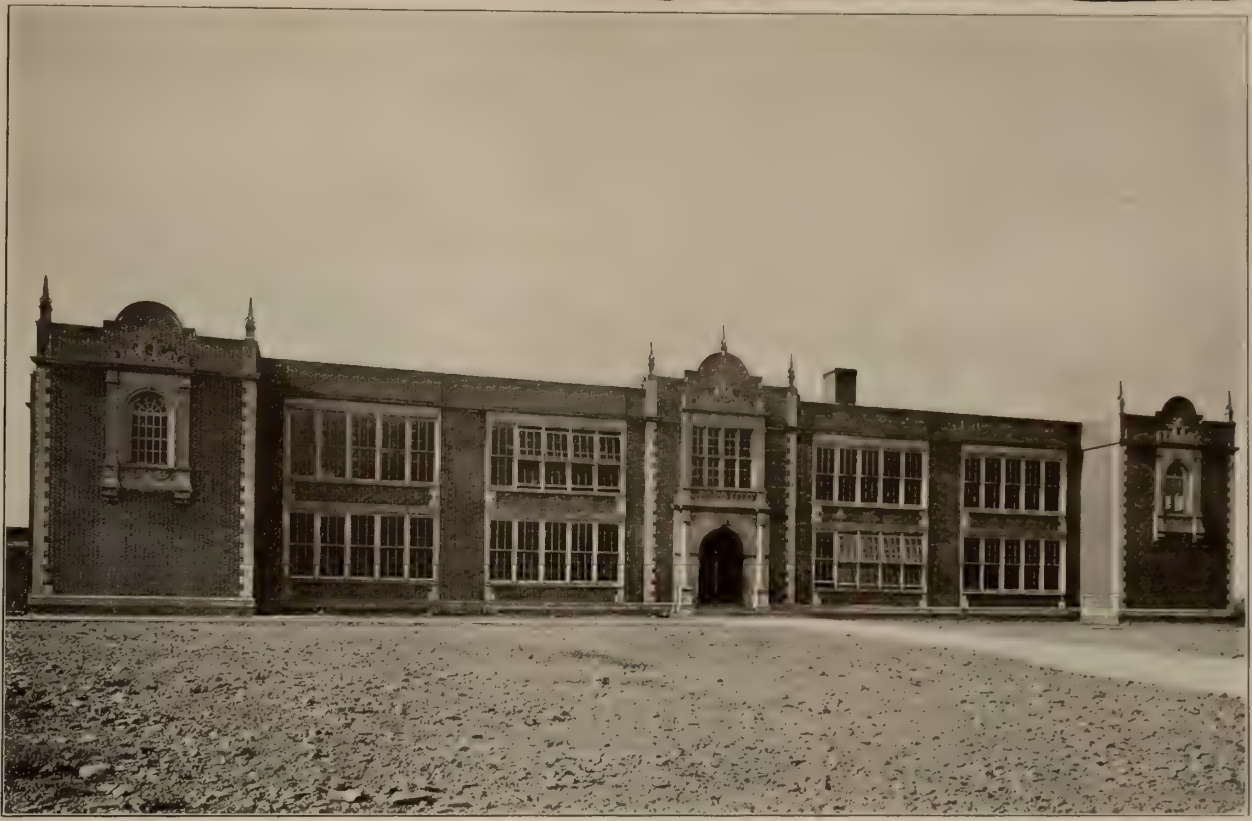

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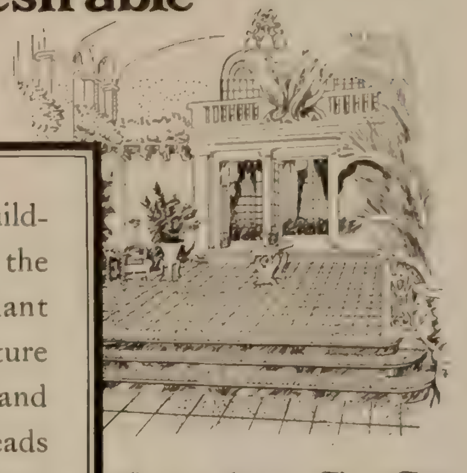

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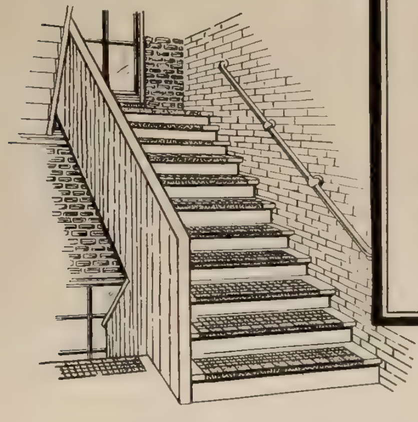
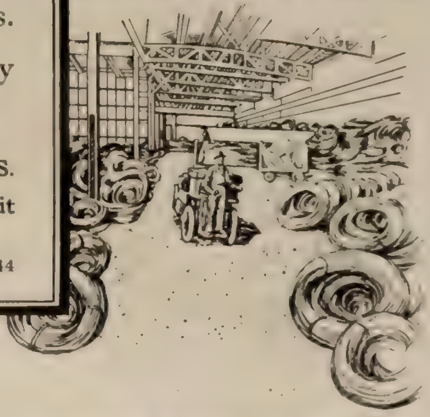


Alundum Mosaic Treads (Mat Type)



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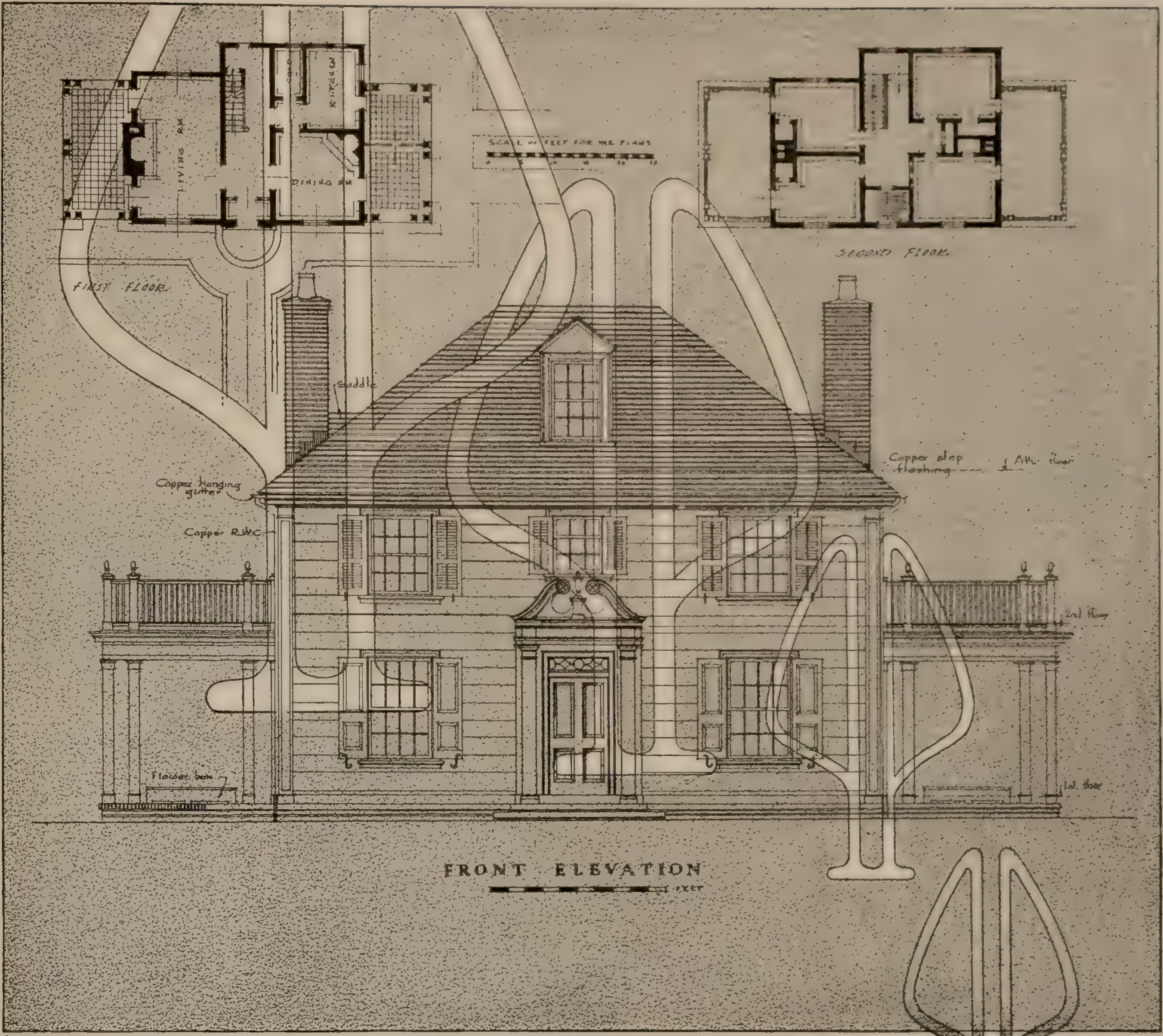

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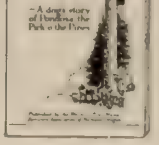

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The experience of two Boston home owners with cracked boiler sections

THIS case is concerned with two houses in Boston, in one of which there was an H. B. Smith Mills water tube boiler of the drum type, and in the other a push nipple boiler of another well-known make.

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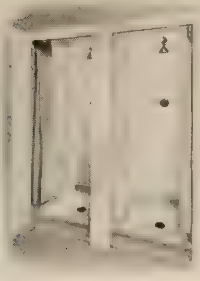

The walls and toilet partitions are of pure white Vitrolite. They can never become dulled or stained. A damp cloth will clean them thoroughly.

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Lazarus, Whitehouse & Fouilhoux
Plumber:
J. A. Bernardi

Washington County Memorial Hospital
Bartlesville, Oklahoma
Architect:
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Plumber:
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VOL. LII. No. 2

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THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. LII AUGUST, 1925 NO. 2

The Restoration of Fort Ticonderoga

Alfred C. Bossom, Architect

THE original fort at Ticonderoga was built on Fort Carillon, where the Iroquois Indians were when Champlain found them in 1609. He built a stockaded fort to control the passage of people from Canada down to New York, for this was the one point where the waters flowed both northward and southward. The sound of the waters gave the name of Carillon, as they could be distinctly heard in those days as they flowed from Lake George down into Lake Champlain. Lake George itself flows southward into the Hudson River, while Lake Champlain flows north into the St. Lawrence River.

A small tea-house overlooking Lake Champlain.

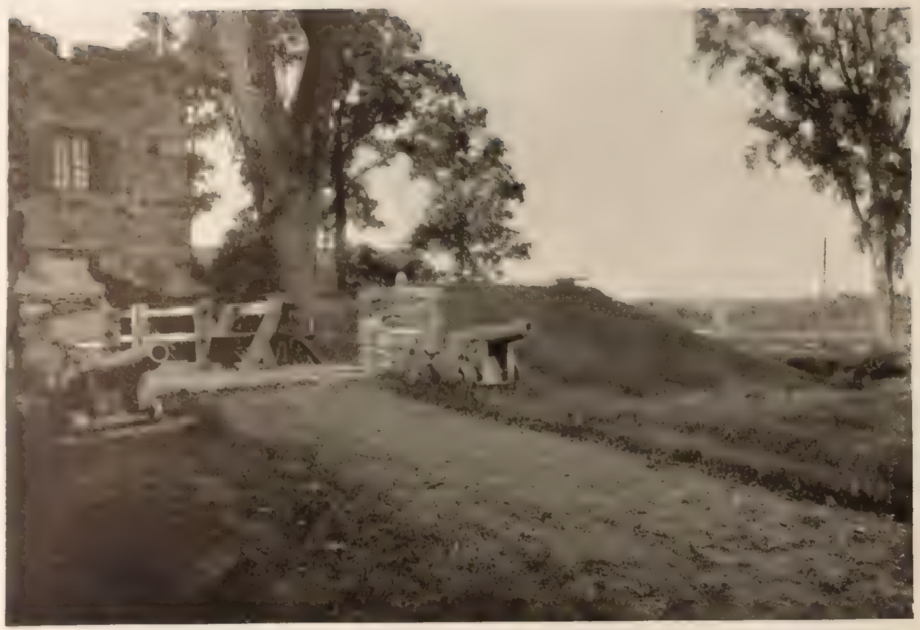
About one-third of the fort has been completely restored and is now used as a museum for objects relating only to this particular spot, and it is not intended that the entire fort shall ever be completely restored. The remainder, however, is to be preserved from further depredation or the effects of the elements. Below the fort walls is the old King's Garden, or "Le Jardin de Roi," in which the French officers undoubtedly used to promenade during the long intervals when they had no Indians or Americans or British to fight. This has also been restored in structural form to about what it was, and a lot of English hawthorn that was brought over by the British during their occupation has been collected about the property and replanted within its limits, making, with other plantings under the direction of Marion C. Coffin, an exceedingly attractive arrangement of landscape work. The endeavor is to maintain the old lines, which the plans that we have discovered showed originally existed.

The pavilion originally was a small house built at the end of the garden in the early part of the last century, and when it was decided in 1909 to start the restoration of the fort this was a ruin, the cows using the various rooms for stalls. It was about as far gone as anything could be, but was literally entirely remade and enlarged, preserving in every detail all of the character and interest that had accumulated there during the life of the building.

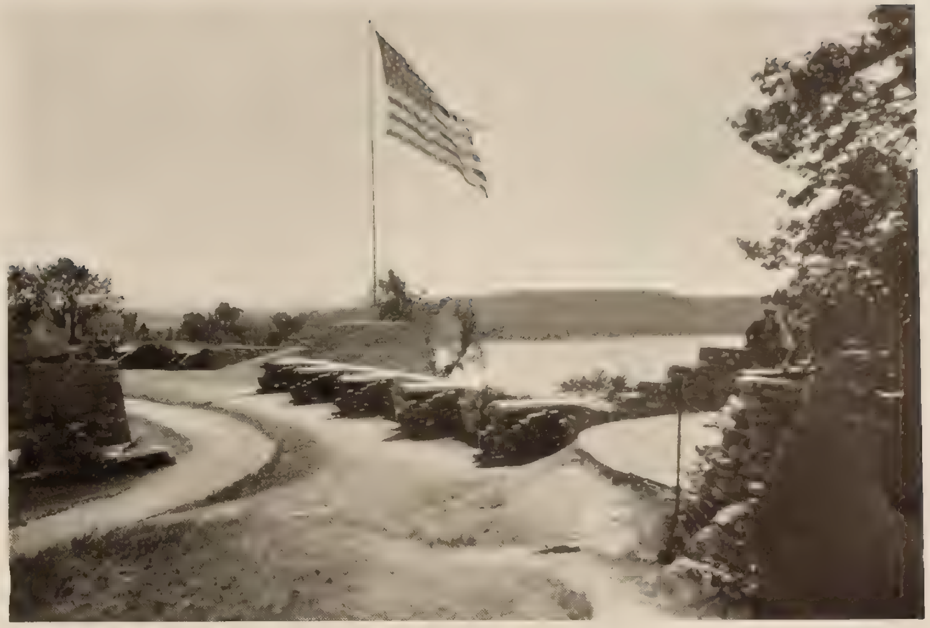
The Y–D House originally was built in the same form as the settlers built their log-cabins, under the protection of the fort. The trappers and huntsmen, who in the early days of the fort's existence gathered around it for trading purposes and protection, were not allowed within the walls, but had to build their homes between it and the waters of Lake Champlain in order to obtain protection from the fort's strong arm.

The Germain Redoubt is a relic of the French occupation, while the fort itself is much more a relic of the English, though the English developed it along the original Vauban lines. This was originally constructed to protect the fort against surprise attack from the north. The embankments and ditch are exactly as they were built, and the redoubt itself was connected to the main fort by an embankment and ditch near the fort by a stone redoubt constructed under the orders of Monsieur Pont LeRoy. Beside this was a stone quarry. It may have been used as a protection for the quarry, for it was from here that the stone for the fort was obtained.

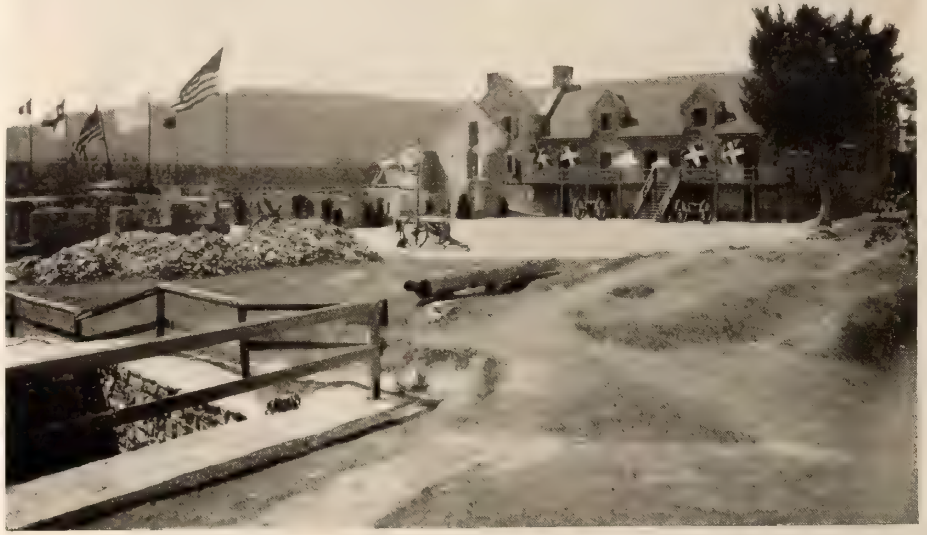
Iron gate leading to "Le Jardin de Roi."



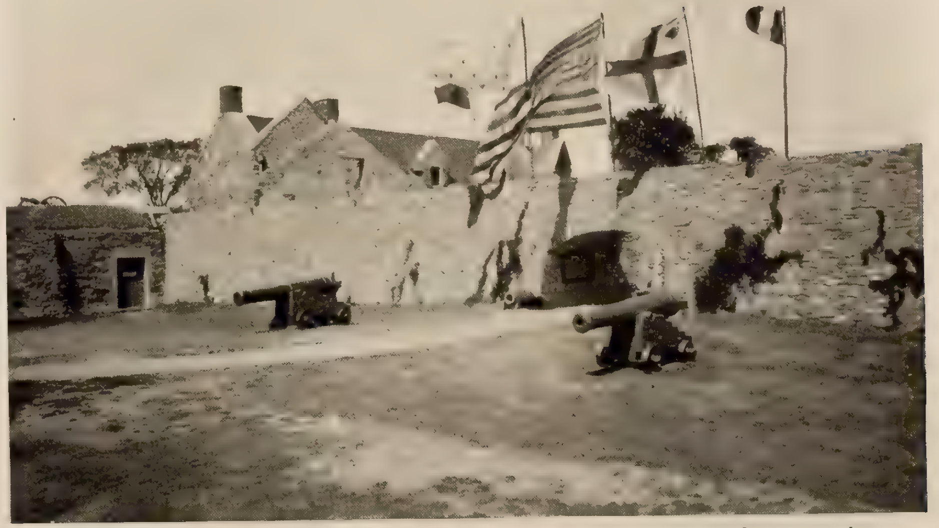
The bridge and moat to the Germain redoubt. This was one of the outlying forts in connection with Ticonderoga during the French occupation, and formed the end of a great line of earthworks that extended practically across the promontory which was crowned by Fort Ticonderoga. This is now the possession of Major Howland Pell, who uses it as a summer residence.



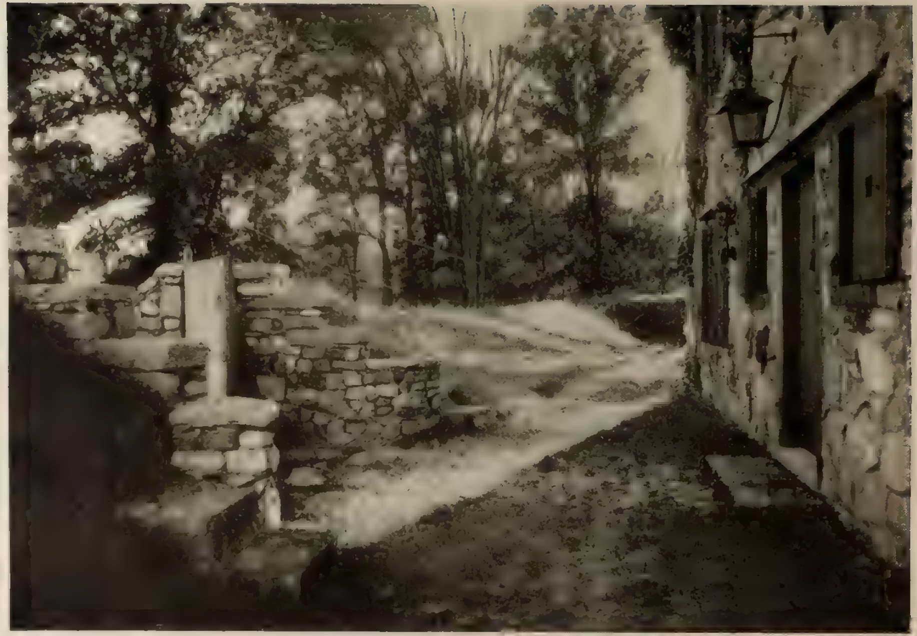
The driveway into the fort around the corner of the southwest bastion. The battery of guns here shown were presented to the fort by the authorities in England, and are of the period when Ticonderoga was in its glory.



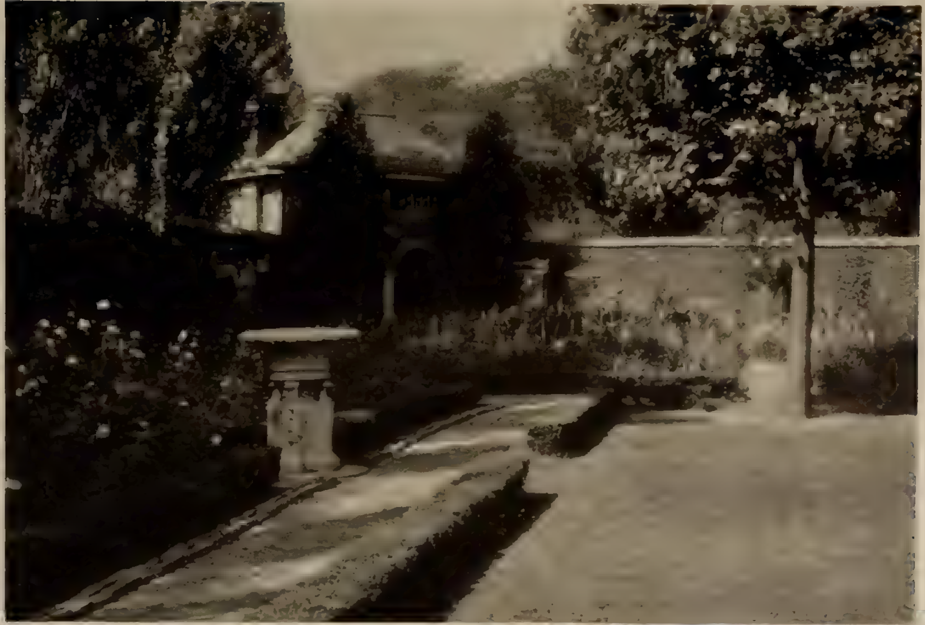
A view across the Place d'Armes at Fort Ticonderoga, showing the west barracks and the partially restored south barracks. It was in the room on the upper left-hand side of the west barracks where Ethan Allen demanded the surrender of Fort Ticonderoga in May, 1776 ("In the Name of the Great Jehovah and the Continental Congress"), from Captain de La Place.



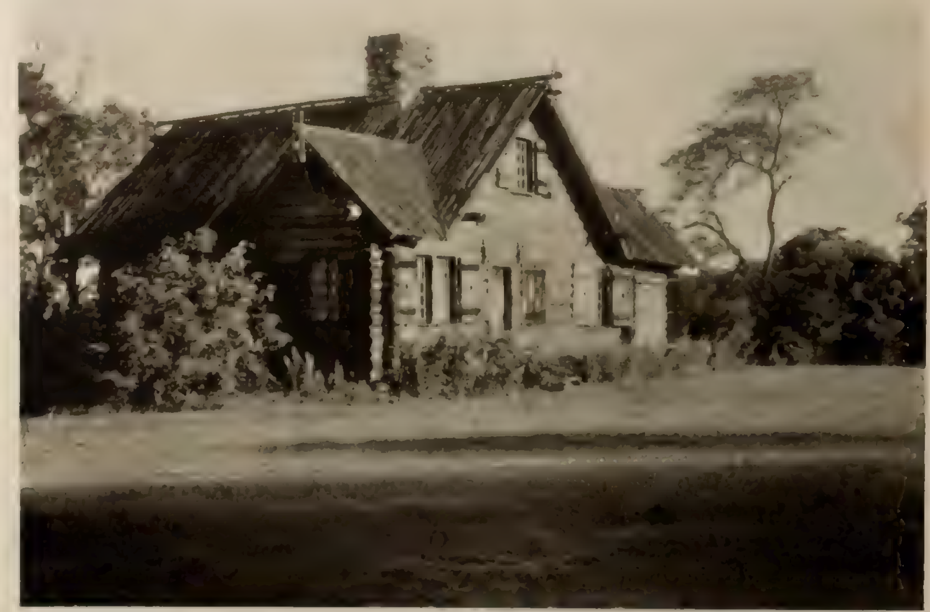
The entrance-way to the Place d'Armes with the flags flying of the famous regiments that were there. The southwest bastion seen on the left-hand side of the picture.



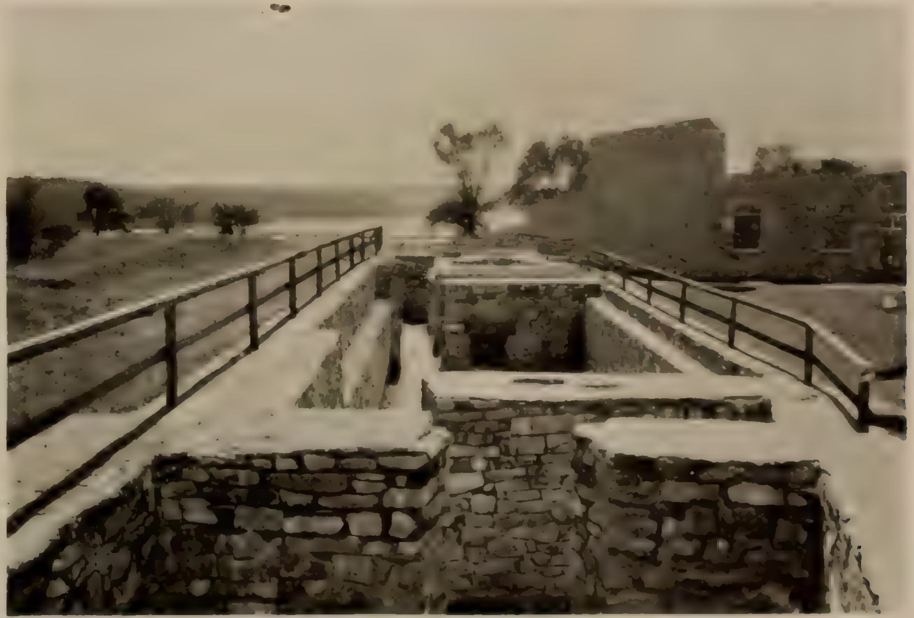
Within the earthworks that formed the outer protection of the Germain redoubt, with the entrance to the drawbridge and moat on the left. The trees in the distance have all grown, of course, since the French evacuation, which gives some slight idea as to how long ago this was.



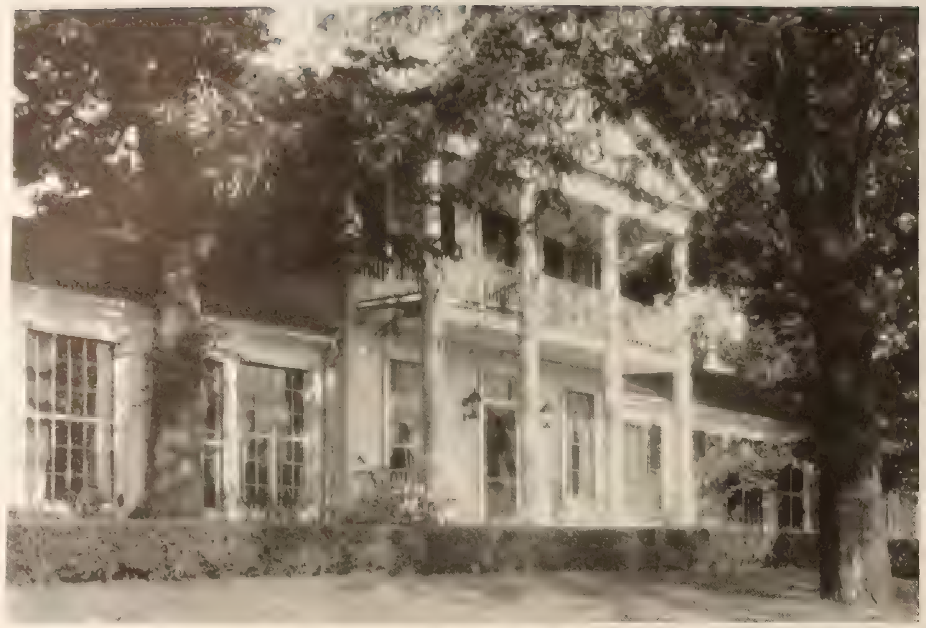
Corner of the "Le Jardin de Roi," showing a small summer-house. The walls around this garden were all built with rejected bricks from near-by brick-yards.



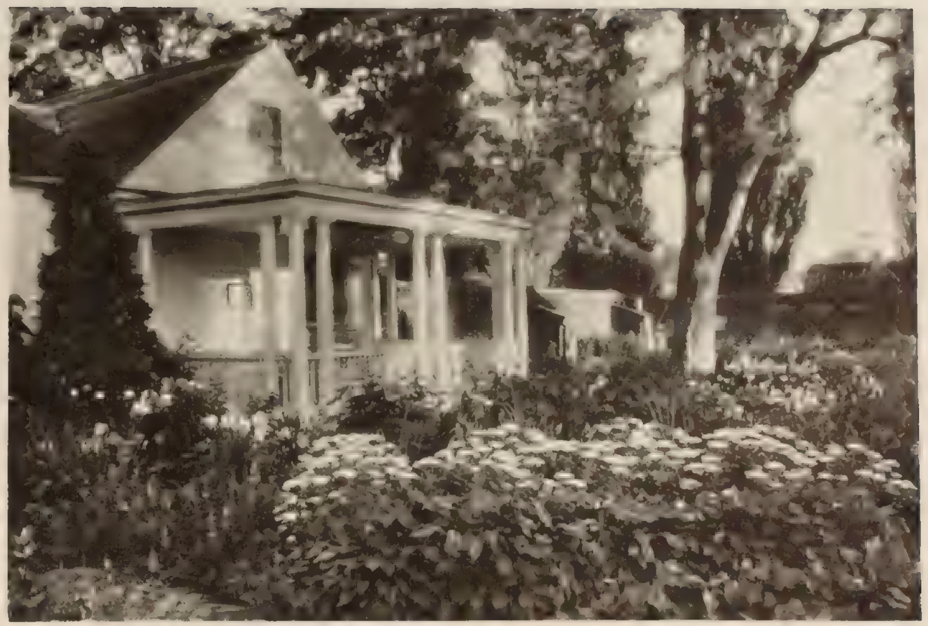
The log-cabin or "Y–D" House, built in the manner of the original homes of the settlers in this district, who used to build under the protection of the walls of Fort Ticonderoga.



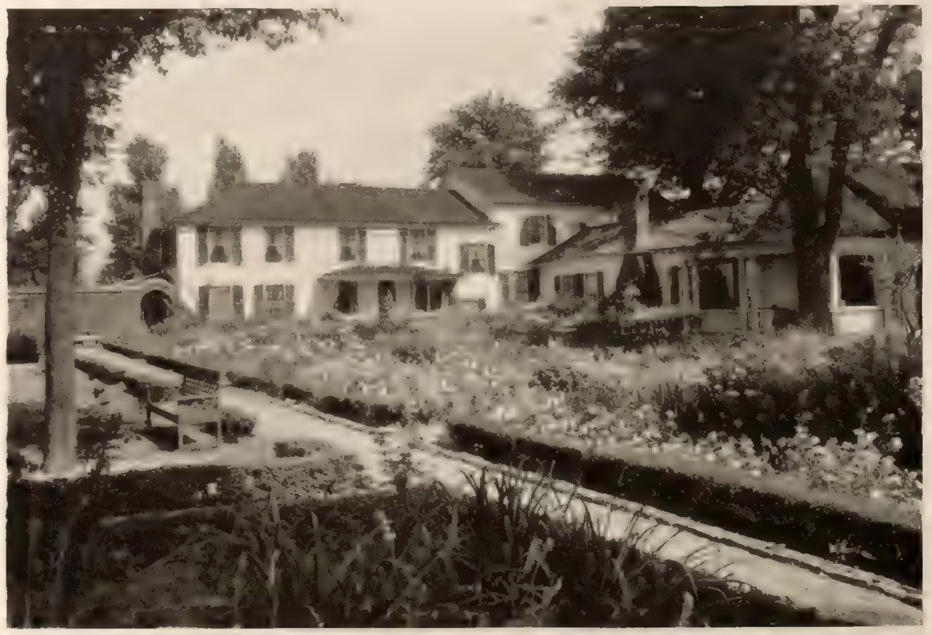
View showing the method adopted to preserve the walls of the existing south barracks, so that the elements can do no further damage to this historic spot. At the same time it is not desired to entirely rebuild the fort and make it a modern reproduction of a great historic monument.



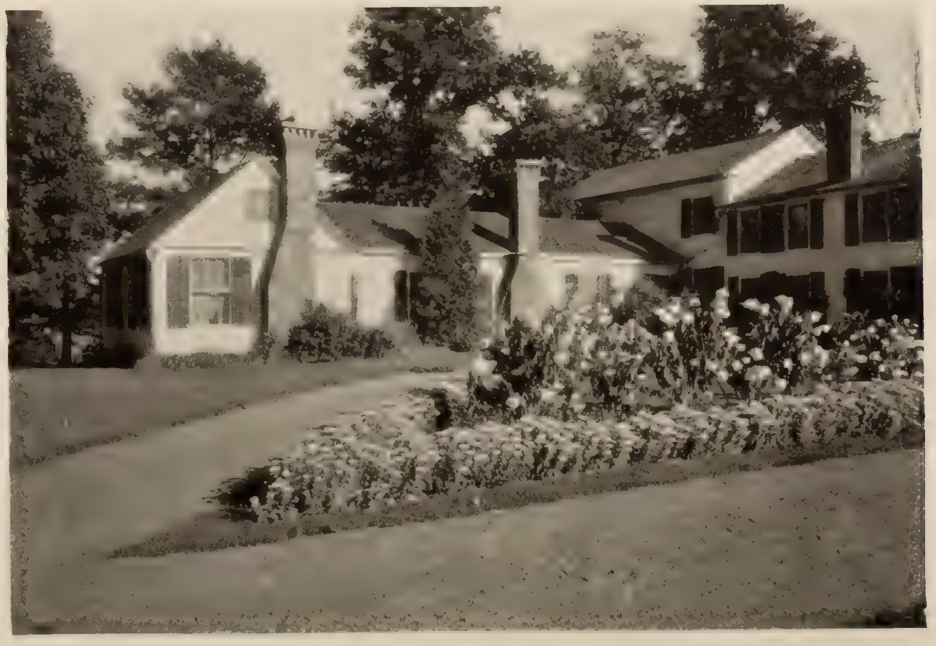
Portico of the pavilion which overlooks Lake Champlain. It is opposite this spot where General Champlain in 1609 landed and fought the Iroquois Indians, and thereby gave the name of Champlain to this great body of water. The illustration indicates the plan of the house, which has a high central section with two extending wings. The front of each wing takes the form of a long corridor against which all the rooms open, when the entire corridor faces the land.



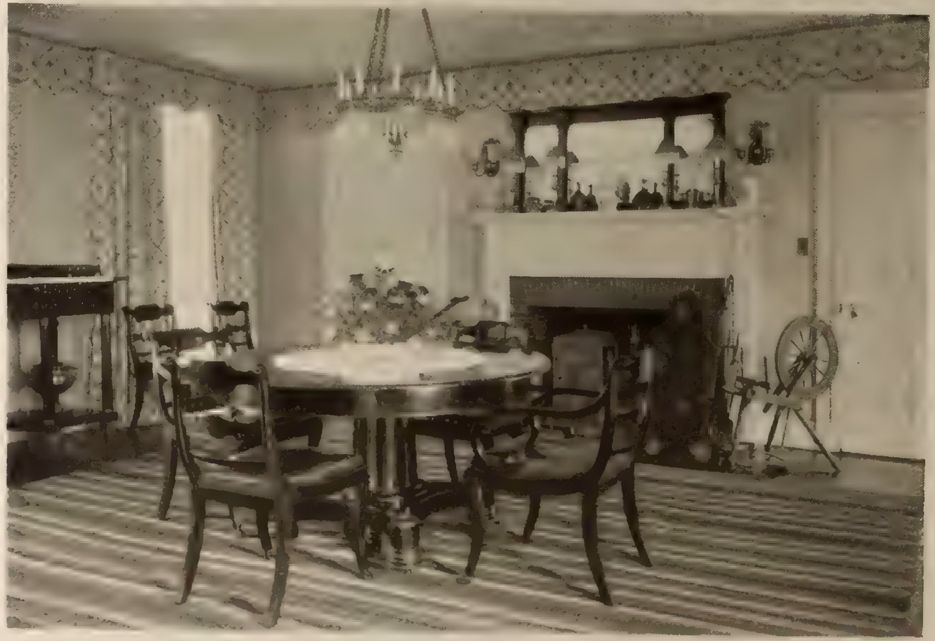
Porch behind the sitting-room, which is like the prow of a boat driven into a mass of foliage.



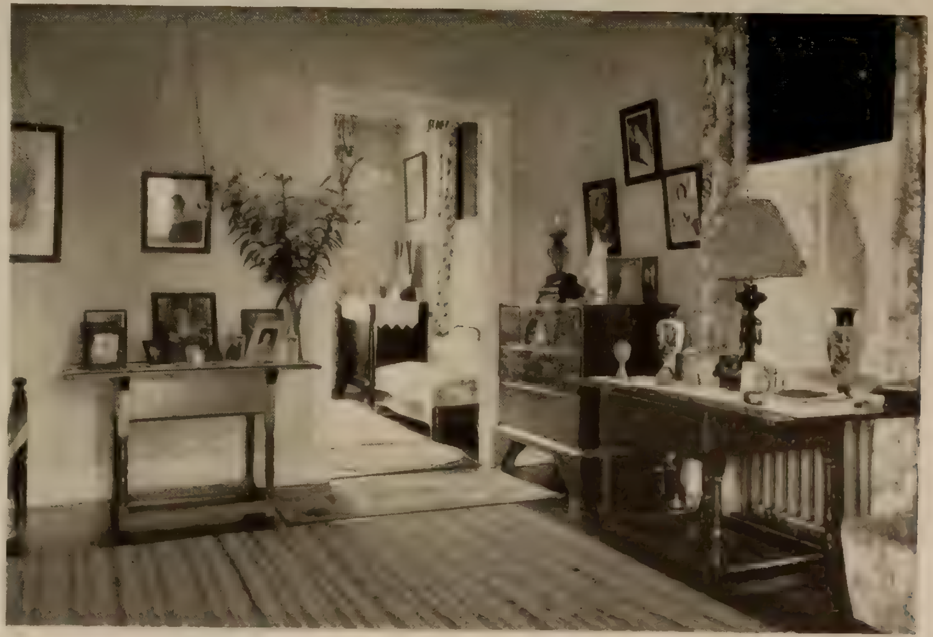
Rear view of the pavilion from "Le Jardin de Roi," the general treatment of this garden being the banking of flowers toward the house and a suppression and introduction of lawn and pool in the middle. Marian C. Coffin was the landscape architect.



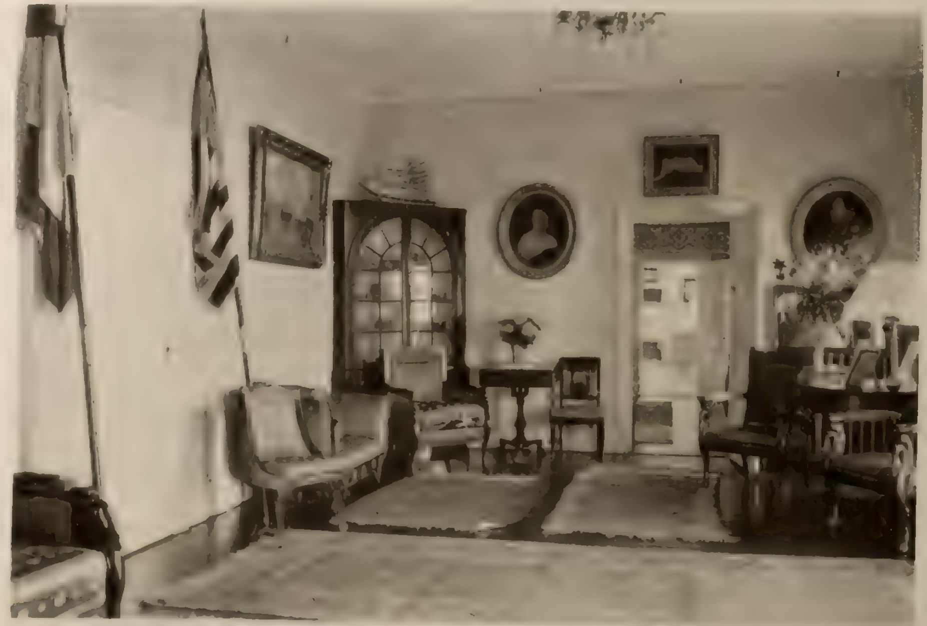
Driveway to the rear of the pavilion, showing the low formation of the wings in contrast to the high central section.



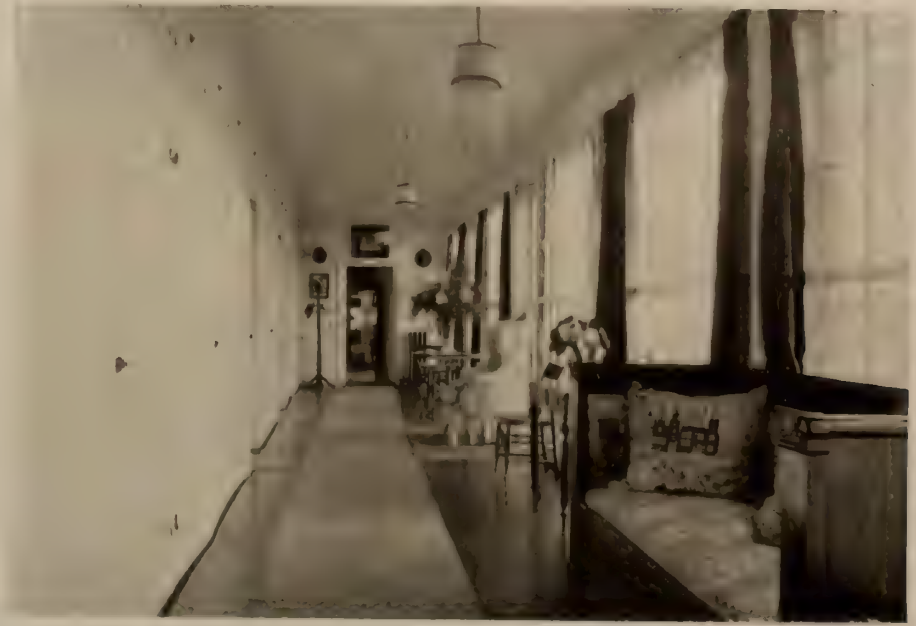
Dining-room of the pavilion. All the decorations in this room are made of old hand-blocked chintz fixed to the wall. The walls themselves are a very soft biscuit yellow.



One of the bedrooms in the pavilion.



The entrance hall of the pavilion. The endeavor has been made throughout this entire house to furnish it in character with the great events and people that have been connected with Ticonderoga. The walls are lavender with white trim.



A corridor facing Lake Champlain, from which the bedrooms of the pavilion are entered.

Color in Architecture

"AMERICANS are continually criticised for their failure to respond to the artistic or beautiful," said a specialist and authority on color, recently.

"American temperament is supposed to be dominated by materialism and commercialism. How far the environments in which the great majority of Americans live have influenced their colorless temperaments may be judged when one pictures in the mind's eye the external atmosphere of a typical American city or town which, to even a tolerant observer, is drab, colorless and uninteresting. American 'Main Streets' are the cradles of American temperament.

"In every phase of modern life color now makes its appeal. Our books, periodicals, and advertising are all colorful. Our clothing, our vehicles, the theatre, and our shop-windows outdo one another in presenting to the mind a color picture. As life becomes more colorful in all its aspects, so the visible expression of that life—architecture—must become increasingly colorful, and architecture to-day is at the threshold of a color Renaissance.

"The possibilities of architectural color expression offered by reinforced concrete represents the simplest and more responsive avenue of approach. The colors suitable for the body of concrete structures are only limited by the artistic conception of the architect. There are no decidedly right or decidedly wrong colors. Each color is suitable to a particular architectural type, environment, texture of finish, and roof and trim color-scheme. The scope of selection is an inspiration in itself. Then, too, concrete color stain is a permanent stain and architects need not fear the havoc, to their color selection, of sun and weather.

"Colored concrete is not limited to urban cottages, but has even a greater service to offer to residences and buildings in congested cities. In the country, trees, sky, flowers, and shrubs offer colorful backgrounds, but in the city, where the great majority of our population is located, the majority of waking hours are spent amid the grayed and dingy backgrounds of the city streets.

"Residential blocks of variegated colored concrete, far from being an eyesore, can be made a source of exquisite delight. In a run-down, dilapidated neighborhood, only a few blocks away from the busiest business corner in New York City, a group of artists a few years ago purchased two rows of houses on two adjacent streets, with backyards adjoining. They remodelled the exteriors of the old structures with concrete and tinted the back walls of the houses in a charming array of soft blues, stone pinks, gray greens, and warm buffs. The back fences were removed and a community garden took the place of the individual backyards.

"The selection of the color for the concrete depends on the architectural type of the house, its surroundings and the roof and trim color-scheme which is to be used with it. Warm cream and fawn are always a dependable selection. With the cream, several excellent color-schemes readily present themselves.

"A brown roof can be used with green trim; a green roof with brown trim; or a red roof with white trim.

"Lichen green, terra-cotta red, stone pink, sage-green, Venetian orange, all offer interesting and practical possibilities for stucco houses. Each color, of course, demands artistic discernment in the selection of the other colors to be used with it.

"The coloring of the walls becomes the problem of the architect and builder as well as the decorator."

Zoning Laws Have Proved Their Great Value

A STEADY growth in the realization by property-owners that the Zoning Ordinance of New York City is a measure designed to protect their interests is evidenced by the gradual increase in the number of strengthening amendments to the zoning maps made by the Board of Estimate. In 1916, when the Zoning Ordinance became a law, the Board of Estimate was given the power to make needed changes in the restrictions imposed by the ordinance, after having held a public hearing on each question of raising or strengthening restrictions.

In the year 1923 alone there were 81 such changes to the zoning maps of the city. Of the 81 changes, 62—or 77 per cent of the changes—were the result of petitions by property-owners that restrictions in their districts be strengthened. The increase in the number of strengthening changes made by the board is clearly shown by the following figures for the years 1917 to 1923:

Year 1917—Strengthening changes 16% of total changes.
Year 1918— " " 23% " " "
Year 1919— " " 35% " " "
Year 1920— " " 56% " " "
Year 1921— " " 61% " " "
Year 1922— " " 77% " " "
Year 1923— " " 77% " " "

These figures are made public in a report entitled "Zoning Practice in the New York Region," by Edward M. Bassett, prepared for and published by the Regional Plan of New York and Its Environs.

The report points out that there has been a steady change of attitude on the part of property-owners toward restrictions imposed on buildings by the zoning law. They have come to realize that instead of confiscating values of their property, the zoning law protects and maintains those values.

In commenting on the growth of the number of strengthening amendments to the law, Mr. Bassett says in the report:

"These proportions show that the zoning plan had a vitality which was little suspected at the beginning. They show that, as property-owners become more familiar with the protection afforded by zoning, their tendency is to petition the Board of Estimate for an increase of that protection. In the main these changes are brought about by property-owners themselves, for the Board of Estimate seldom refuses to make a change where the property-owners set forth a good case. The Board of Estimate, however, through its chief engineer and the local boards of the various boroughs, makes careful investigation in order to be sure that the proposed change will not injure the city as a whole.

"The experience of eight years has proved that the protective features of the zoning law largely outweigh its drawbacks. It does not prevent proper changes of use, height and bulk, of buildings, but allows these changes to come along when the locality is ripe for a change instead of having the change brought prematurely by two or three exploiters who, for the sake of their own profits, bring disaster upon a multitude of honest investors."

Copies of Mr. Bassett's report, which gives in addition a model State-enabling act for zoning, may be obtained from the Regional Plan of New York and Its Environs, 130 East 22d Street.

The Rolling Rock Country Club

E. P. Mellon, Architect

THE Rolling Rock Club is situated in Westmoreland County, about fifty miles east of Pittsburgh, on the Laurel Ridge of the Allegheny Mountains. It is surrounded by mountains and forests, and from the top of its tower a view is obtained of portions of four different counties.

On a knoll in the midst of the forest sufficient space was cleared to construct the club house and necessary surroundings for club purposes. A golf course was also constructed, the first tee of which is located adjoining the club house.

The problem submitted to the architect was an intricate one, as it demanded an absolutely fire-proof building without producing a formal appearance, and on account of the fire-proofing anything pertaining to a rustic appearance was out of the question. The building is a large rambling one, constructed of terra-cotta and stucco, with trimmings of Indiana limestone, and roofed with Tudor slate. The exterior iron work and all the details harmonize in producing an exceedingly pleasing Italian effect, and any formality or hardness of line which is generally felt in such buildings is entirely eliminated by the building being immediately surrounded by forest trees.

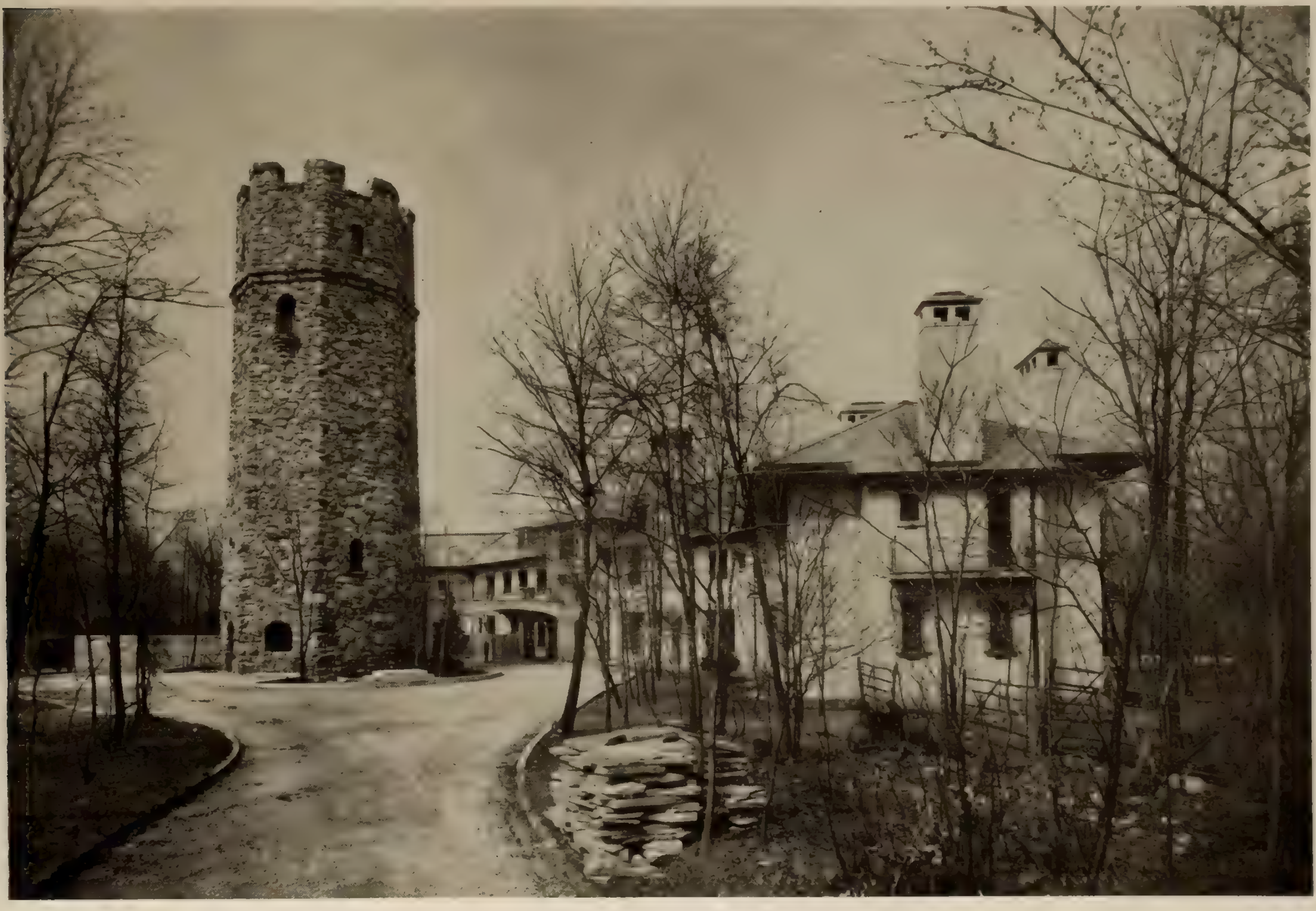
The interior of the building contains every possible requirement of the modern country-club building, and the rooms are finished in a most artistic and comfortable manner.

Some of the special and unusual features are the main stairway, the risers and treads of which are marble, and the treads inset with cork so as to prevent slipping. The railing is also to be noted for its Italian design.

The smoking-room is finished in the same manner as were the first houses of the Allegheny Mountains, which were log-cabins. The logs are hewn and set in place in the same manner as the old-time construction required. The fireplace is built of native surface stones and boulders. The ceiling is constructed of rafters and weathered boards from some of the old buildings, which were originally located on the property.

A very unusual feature of the large living-room fireplace is that it is self-feeding with logs by means of an endless chain, which extends to the logroom below. By touching a button at the fireplace an endless chain revolves and lifts the logs, by hydraulic pressure, to a position directly above the fireplace opening, from which they automatically drop into place on the fire-dogs.

On the exterior of the building to the left of the main entrance there is an outside, heated water swimming-pool, twenty feet by seventy-five feet. This pool is constructed



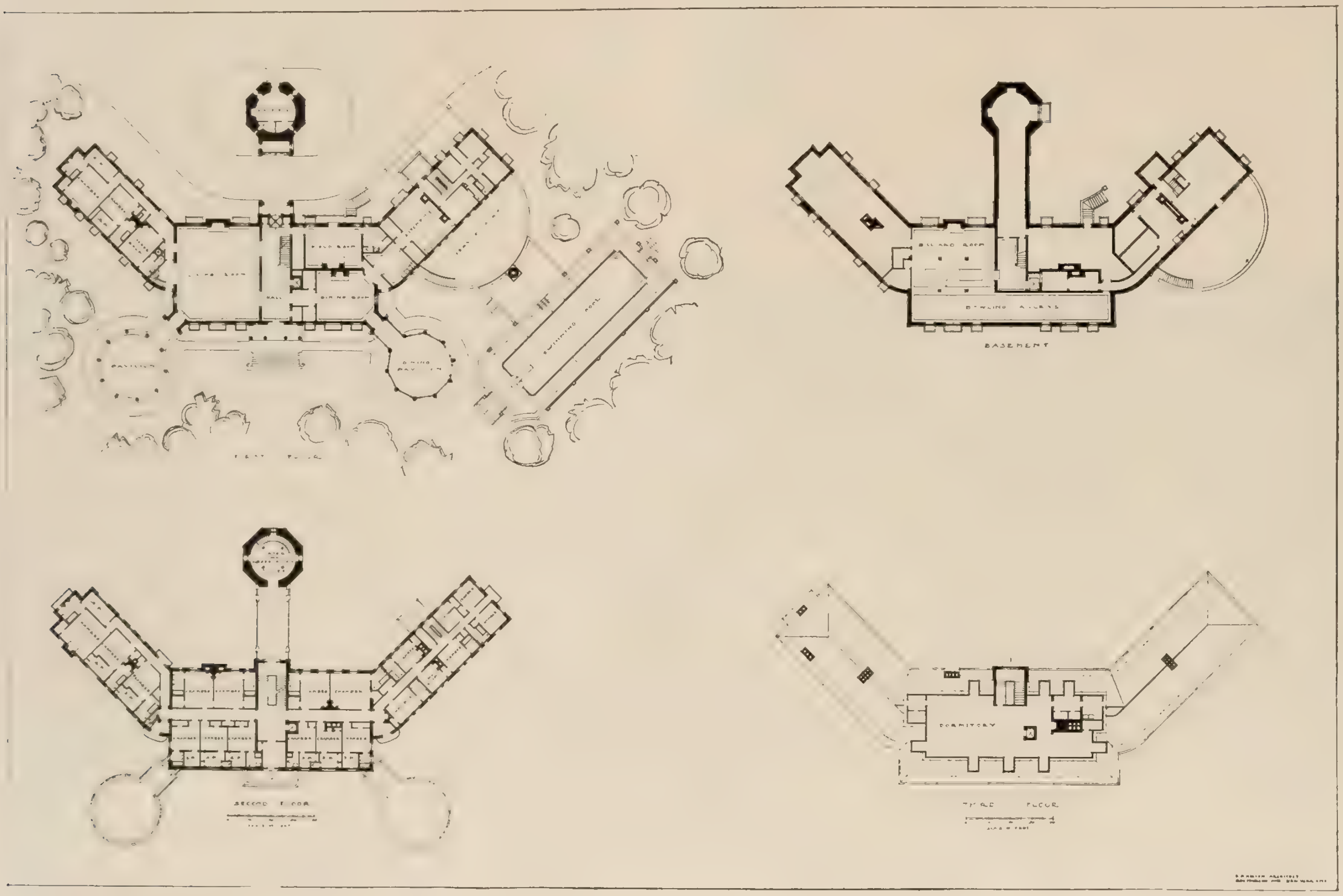
Rear of club house. Tower for housing water-tank, for forest-fire observation, and observatory.

in such a manner that it can be used for skating during the winter. To protect the pool from being harmed by the expansion of the ice, the sides of the pool are battered at the top. Also, to protect the skaters from submerging in case of the ice breaking there are hung floats just below the ice. The pool is surrounded by adjustable electric-lighting, so as to provide for night skating.

A unique feature of construction is the large tower which is built to the rear of the club building. This tower was built for three purposes: one being to contain the water-tank; another for the pleasure obtained by the extensive views; and the third for forest-fire observation. The tower is seventy-five feet high. The walls are thirty-seven inches in thickness and constructed in their entire thickness of native field boulders. Within is a circular stairway of concrete leading to the top. The water which enters this tank is fed by natural gravity from catch-basins located on the mountain-side, two miles distant and three hundred feet above the top elevation of the tower. These catch-basins are supplied by natural springs. This supply is never exhausted, and when the main tank is full the overflow fills a secondary tank, from which the overflow supplies the building, the swimming-pool, and the surplus distributes itself for irrigating the golf grounds.

Under the tower are constructed the boiler and fuel rooms for the heating of the club building. From the boiler-room below there is an ash-hoist which operates within the thickness of the tower wall, hydraulically operated. This runs to a point sufficiently high above the drive grade to permit of loading wagons, and with elimination of manual labor. The mechanism is all concealed, but when the top height is reached the buckets are automatically swung from the interior of the wall to the wagon.

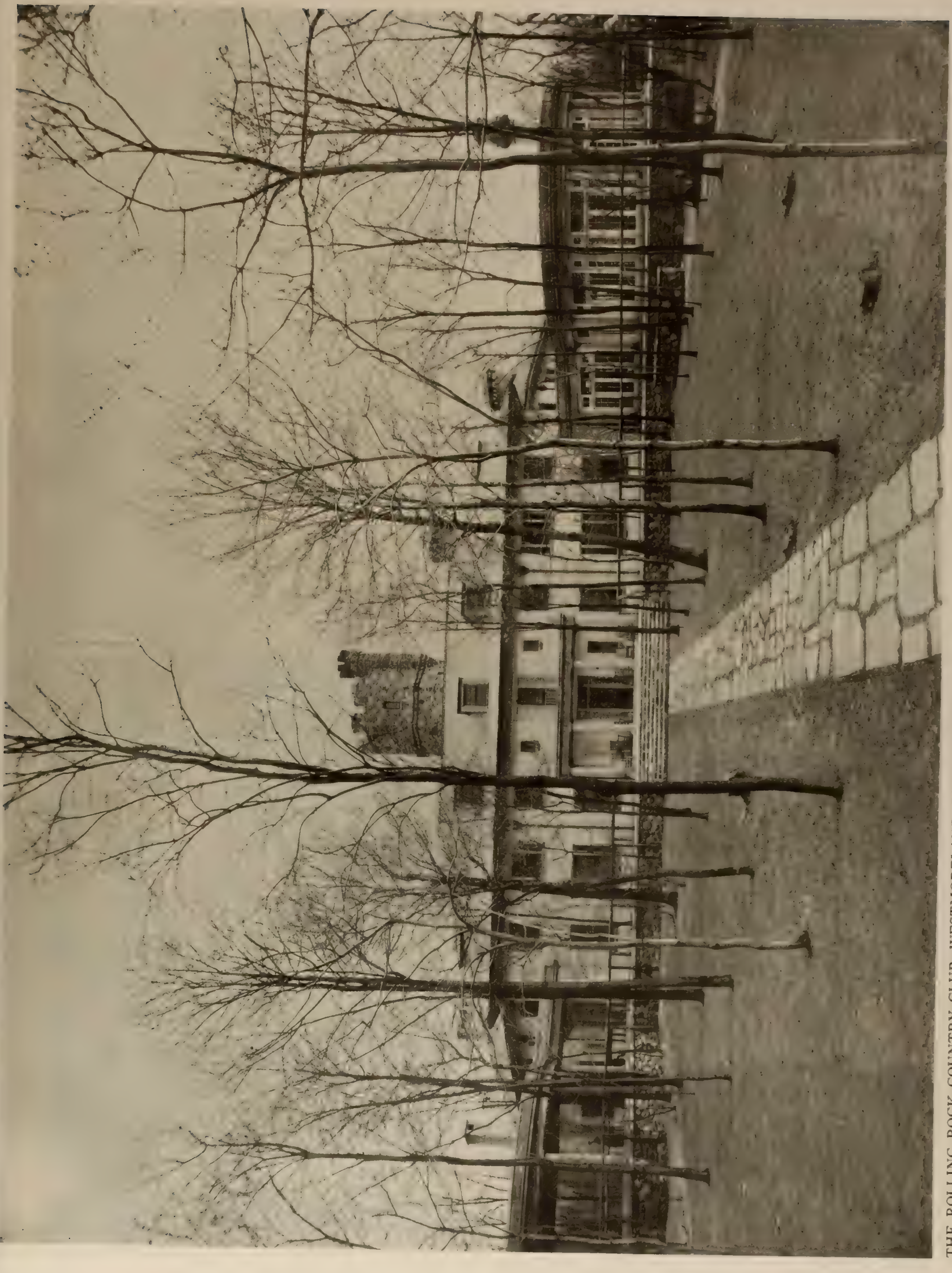
For the construction of the Rolling Rock Club House and its dependent buildings and landscape gardening, native labor exclusively was used and proved to be wonderfully satisfactory, as where skill was required the work was done in the old-fashioned handicraft manner, and no limitations placed upon the amount or quality of a man's daily production. Also, so far as possible, native materials were used which proved themselves to be much superior in quality to the average commercial production.



PLANS, THE ROLLING ROCK COUNTRY CLUB. E. P. Mellon, Architect.

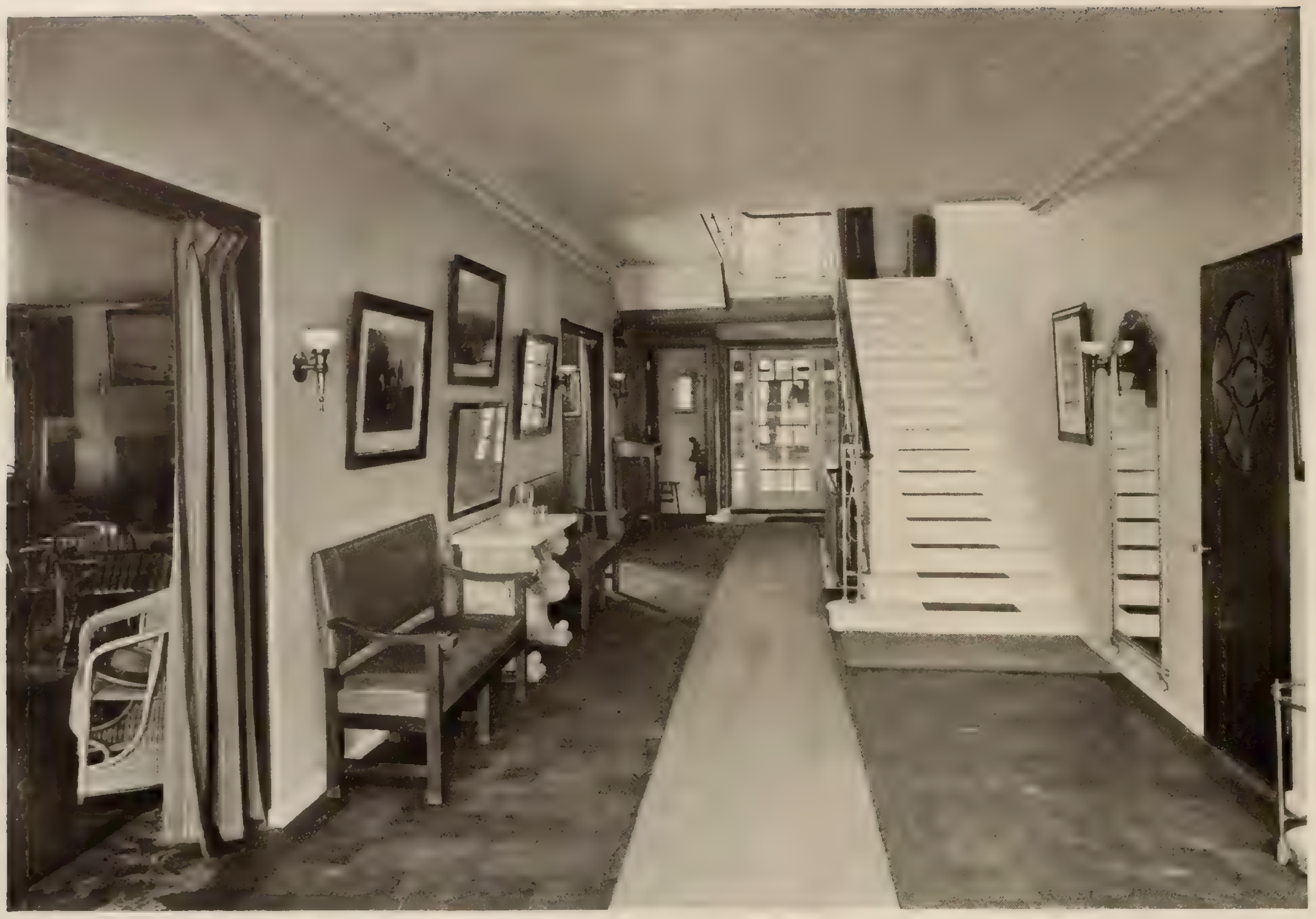
North Carolina's White Pine Excels New England's

WHITE pine planted on the Biltmore estate in North Carolina twenty-four years ago is already comparing favorably in growth with natural stands of the same age in New England, according to tentative estimates made recently by the Appalachian Forest Experiment Station, Forest Service, United States Department of Agriculture. On sample plots in the Pisgah National Forest, yields of 5,000 cubic feet to the acre are being obtained compared with an average of 3,000 cubic feet for New England white pine of the same age on similar sites. The computations made in North Carolina are only approximate, but at least a considerable proportion of the apparent advance over New England timber is easily substantiated in the considerably greater height growth attained in the Southern stands, together with an equal or greater diameter. This increased growth is attributed to the equable climate of the Southern mountains which allows the trees a longer growing season.

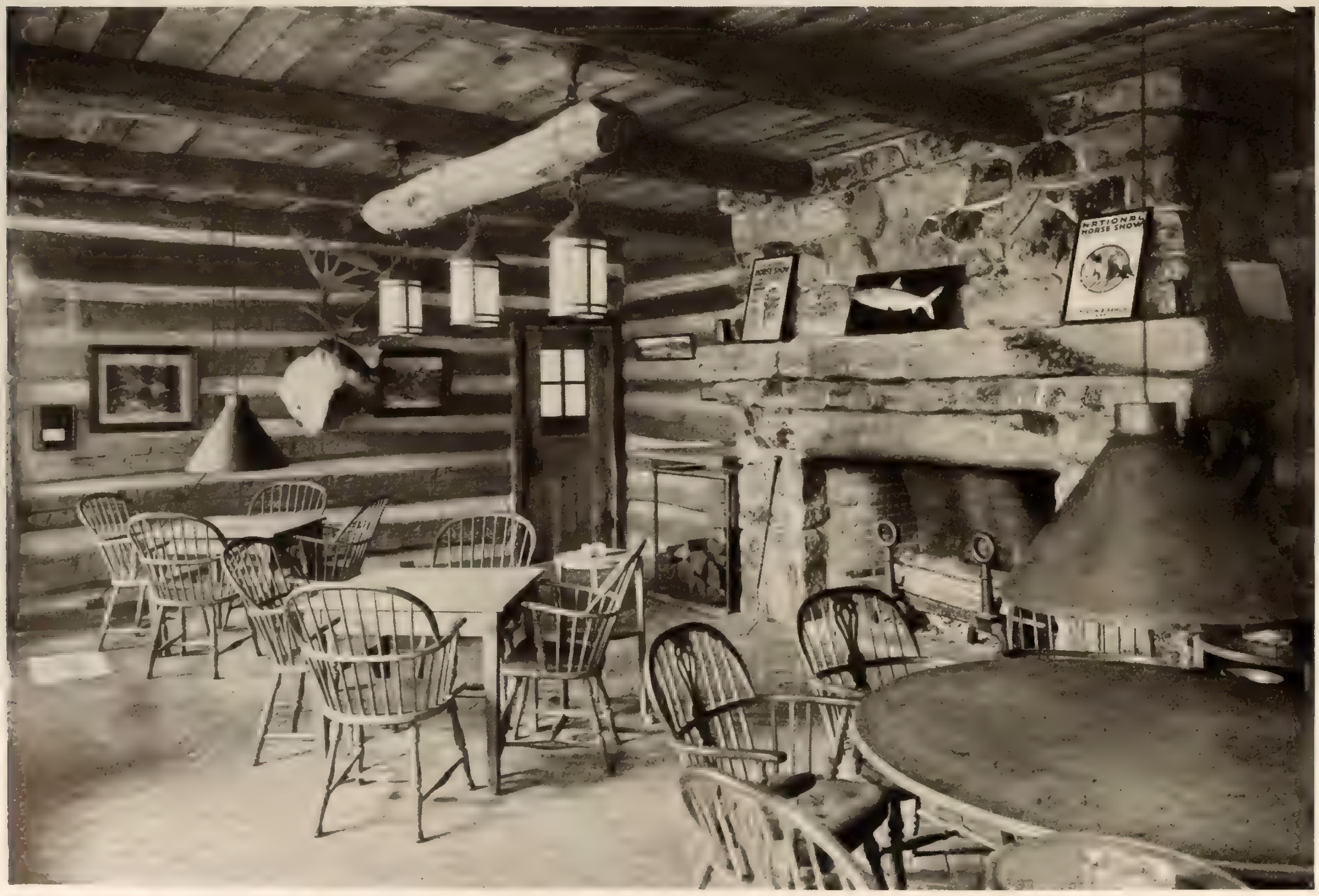


THE ROLLING ROCK COUNTRY CLUB, WESTMORELAND COUNTY, PA.

E. P. Mellon, Architect.



HALL AND STAIRCASE.



FIELD ROOM. E. P. Mellon, Architect.

THE ROLLING ROCK COUNTRY CLUB, WESTMORELAND COUNTY, PA.

ARCHITECTVRE*
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THE PROFESSIONAL ARCHITECTVRAL MONTHLY
*Reg. U. S. Pat. Office

Editorial and Other Comment

A Matter of Sentiment

IN these days there isn't any possibility of letting things alone. Change is the order of the times, and change we must, willy-nilly. When it comes to changing the White House interiors from French to American it is a matter of grave moment to the whole American people. That shrine of the nation's beginnings is not a private residence to be treated as one would treat a little home in the suburbs or in the social belt of the Newport millionaires. It has much of the sacrosanct atmosphere that environs and provokes the reverence of the thousands who make the pilgrimage to Mount Vernon. There the ladies have restored the mansion with the idea of making it express the place as it was in Washington's own days. Happily, they have been able to gather much of the original furniture, and made it look more like a home than an antique shop.

When Colonel Roosevelt lived in the White House it was redecorated under the supervision of the late Charles F. McKim, and in accordance, we understand, with Colonel Roosevelt's preferences. We feel that the White House is but a temporary abiding-place for Presidents, and that the traditions of the place are more to be considered than the personal tastes of passing occupants.

If there is a house in the country that should express in its every detail the spirit of American taste at its best, it is the White House. The beauty and charm of the Colonial, its reserve, lack of ostentation, its democratic simplicity, its dignity and refinement, seem to us quite superior to any product of France, when associated with such a lovely example of our early architecture as the White House.

The changes proposed, we understand, have been suggested by Robert W. deForest, of the Metropolitan Museum of Art, and will be carried out under the able and very competent direction of Mr. R. T. H. Halsey, who is responsible for the arrangement and decoration of the American wing at that wonderful institution.

The President always has his troubles, and in the proposed changes in the White House he and Mrs. Coolidge will be the centre of a nation-wide discussion of "how to furnish the home."

Somehow we can't help feeling that "Colonial fixings" will make a much more appropriate background for present occupants, as well as future, and in saying this we mean to say that it has been a long time since the House was occupied by a family more expressive of the *homely* Colonial virtues we can all admire and appreciate.

We gather from Mr. Halsey's report that a "hodge-podge" of various incongruous furnishings has been gathered in the years, and we feel entirely sure without the knowledge or approval of any one who might be called an authority.

We sincerely hope, in any event, that Mrs. Coolidge will not be deluged about Christmas time with gifts of Colonial heirlooms from all the dust-laden attics in Vermont.

Choosing an Architect

WE have been reading a recent article in *The Churchman* by Mr. William O. Ludlow, of the firm of Ludlow & Peabody, on "Getting the Best Building—How to Start Right." It contains some excellent advice to congregations thinking of building a new church.

Many times there exists the idea that it is quite impossible to engage the services of architects of reputation in a mistaken notion that the cost will be prohibitive. That this is not so has been proved time and time again, and *The Lutheran Church Review* has been continually preaching the benefits of going after the best talent available.

Our church architecture has improved, but there is room for further advance all over the country. Mr. Ludlow points out the essentials of good church designing, and goes on to tell how to make a success of the job after the architect has been selected.

We once wrote an editorial on "Calling the Doctor" that was widely quoted bearing on this topic. Mr. Ludlow says:

"An architect should be selected just as you select those other professional advisers—your doctor or your lawyer—find out what he has done and how well he has done it. This is best accomplished by personal interview, by seeing completed work, or photographs of completed work, by the opinion of former clients of the architect, and, perhaps best of all, by obtaining the opinion of fellow practitioners.

"Having finally selected an architect in whom you have entire confidence, give him your confidence, be entirely frank with him as to your financial resources, take his advice, and put the responsibility squarely up to him for results. In this way you will make a real friend of him, and he will give you the best that is in him. After a number of conferences with you and thorough study of your church needs, he will make sketches of plan and elevation, revising and altering them in conference with you as many times as need be to meet your requirements as to arrangement and available funds, and finally he will produce plans and a picture for publication with an estimate of the probable cost.

"You are then able to put before your people a definite and businesslike proposal, and this will form the basis of your campaign for funds. How this campaign should be conducted is another long story, varied in the telling to fit the widely different conditions of each case. There are able firms who make a business of conducting such campaigns, but as a general observation the outstanding elements of success are these: a thorough organization of the entire membership, competent and enthusiastic leaders, a short and intensive campaign period, and an unwavering faith that God is peculiarly with you in this business of building His house."

From the Paris Exhibition

WE are in receipt of some information from the Paris show of the decorative arts that leads us to the conclusion that it is in the hands of the extreme moderns to a great extent. One writer dwells on the architectural features, and thinks them beneath contempt. Of the exhibits, he says that France, Czecho-Slovakia, Austria, and Spain show the most originality, while Poland, Holland, Sweden, and Denmark have especially interesting exhibits.

The cubists have evidently been going strong, for the tendency of much of the work is toward "angularity of form, and in color there is an utter disregard of those hues which are to be seen in nature."

"Of the national pavilions the two most beautiful are those of Italy and Spain, and the ugliest those of Soviet Russia and Great Britain."

E. Fletcher-Clayton, writing in *The Decorator*, London, says it is "a great pity that the decorative art of the United States of America is not shown; for such, which is unfortunately unknown here, would rank with the very highest for originality." That is a nice thing to say, at least, and we wonder how we should have fared if we had shown our wares.

Bringing the Cellar Up-Stairs

WE have been in many cellars that made us think of the last days, of the vaulted glooms where Romeo and his lady ended their little brief life of love, of cold and damp and worms, and all sorts of unpleasant things, and in days of loved memory we recall certain cellars that were cold and yet not without cheer, where a spirit of genial hospitality prevailed, and gloom was washed away in ambrosial fluids. Why not make the cellar a jolly place for play and comfort, of light and cheer, a usable part of the house? If it can be no longer put to the uses of old, put it to other uses, modernize it. That is the proposition put before architects and draftsmen in "The Ideal Cellar Competition," announced in other pages, and we commend the idea to our readers. Of course the first essential from the merely business point of view is a matter of suitable heating; but there are other good and sufficient reasons for giving the cellar more consideration than as a mere place for storing coal and stoking.

"The second step in modernizing the cellar is to be a recognition by the architectural profession of the possibilities of designing and planning the cellar of the average American home of eight rooms or more in such a manner that the cellar space will be provided with a series of practical utility features and one or more interesting, livable rooms, which will add to the living comfort and realty value of residential properties. The purpose of the Ideal Cellar Competition is to place this problem of cellar planning *and design* before the architectural profession for the development of suggestions which will indicate, in a practical manner, the arrangements of cellar space that can be made to provide a direct return, and to establish a capital valuation which will be clearly recognized in residential real-estate transactions of the future.

"The third step, which must naturally follow this valuable economic contribution by the architectural profession, will be the general acceptance of this idea of the improved cellar, and its recognition by owners, builders, and those who sell, rent, or finance homes. Over $2,000,000,000 is at present invested in the cellars of existing American homes, and at the present rate of dwelling construction $300,000,000 is being invested annually in cellar construction by the home-builders of the United States. This Ideal Cellar Competition promises to exercise a new influence on this vast expenditure, which will quadruple the efficiency of the investment and aid materially in offsetting costs."

An Important Announcement to Our Readers

IT is with special pleasure that we announce a new series of articles by Mr. H. Vandervoort Walsh, Professor of Construction, School of Architecture, Columbia University. Our subscribers will recall previous articles by this instructive and interesting writer on "The Construction of the Small House" and on "Apartment-House Construction." These were eminently practical, and gave architects a great deal of information based on years of study and personal contact with modern building methods.

Mr. Walsh's new series will take up a subject of exceptional interest.

In "The Effect of Gravity on Building Construction" he traces the work of the oldest builders, the great achievements of mediæval days, considers the tendency of modern times blindly to follow precedent and old traditions, and says that in spite of this we have learned to build in very different ways from our ancestors. "The new methods of construction are the result of the investigations carried on by a few independent thinkers. The steel frame, reinforced concrete, the truss, Portland cement, and other features of modern construction are absolutely new and are the children of knowledge developed by a few individuals who refused to accept ideas simply because they were old."

The four types of building known to architectural history are: "Skeleton Construction," "Simple Block Construction," "Balanced Block Construction," and "Cohesive Construction."

We venture to say that this series will prove one of the most valuable the magazine has published. It will review the historical periods briefly in passing, but the main theme will bear on thoroughly practical things in modern building construction.

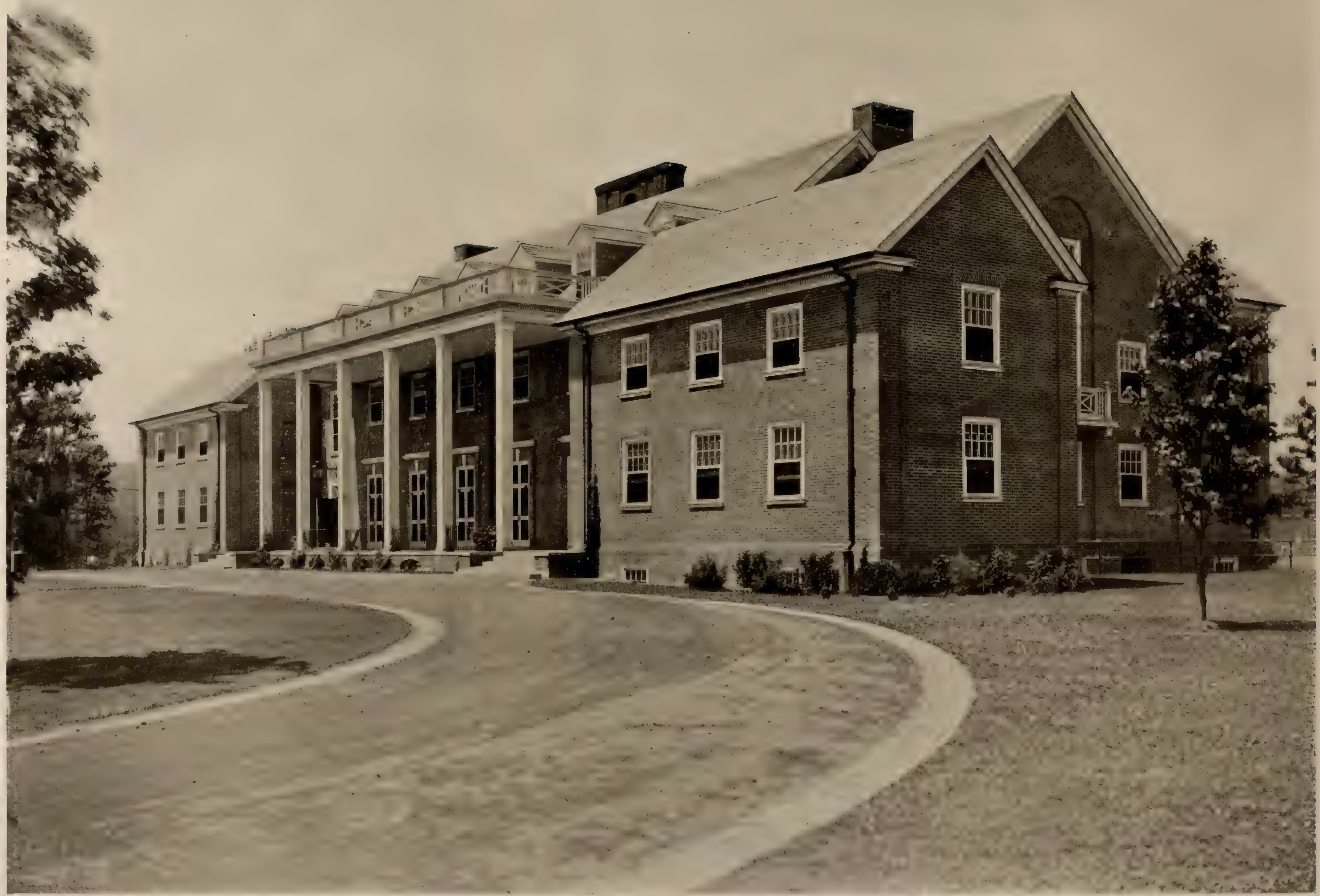
"Galileo gave the first description of a force as a mechanical agent, but he summed up certain ideas that had been growing in other men's minds. These we must consider in their relation to the development of the knowledge of building mechanics."

The series will begin in September and run a number of months.

It Can Be Done

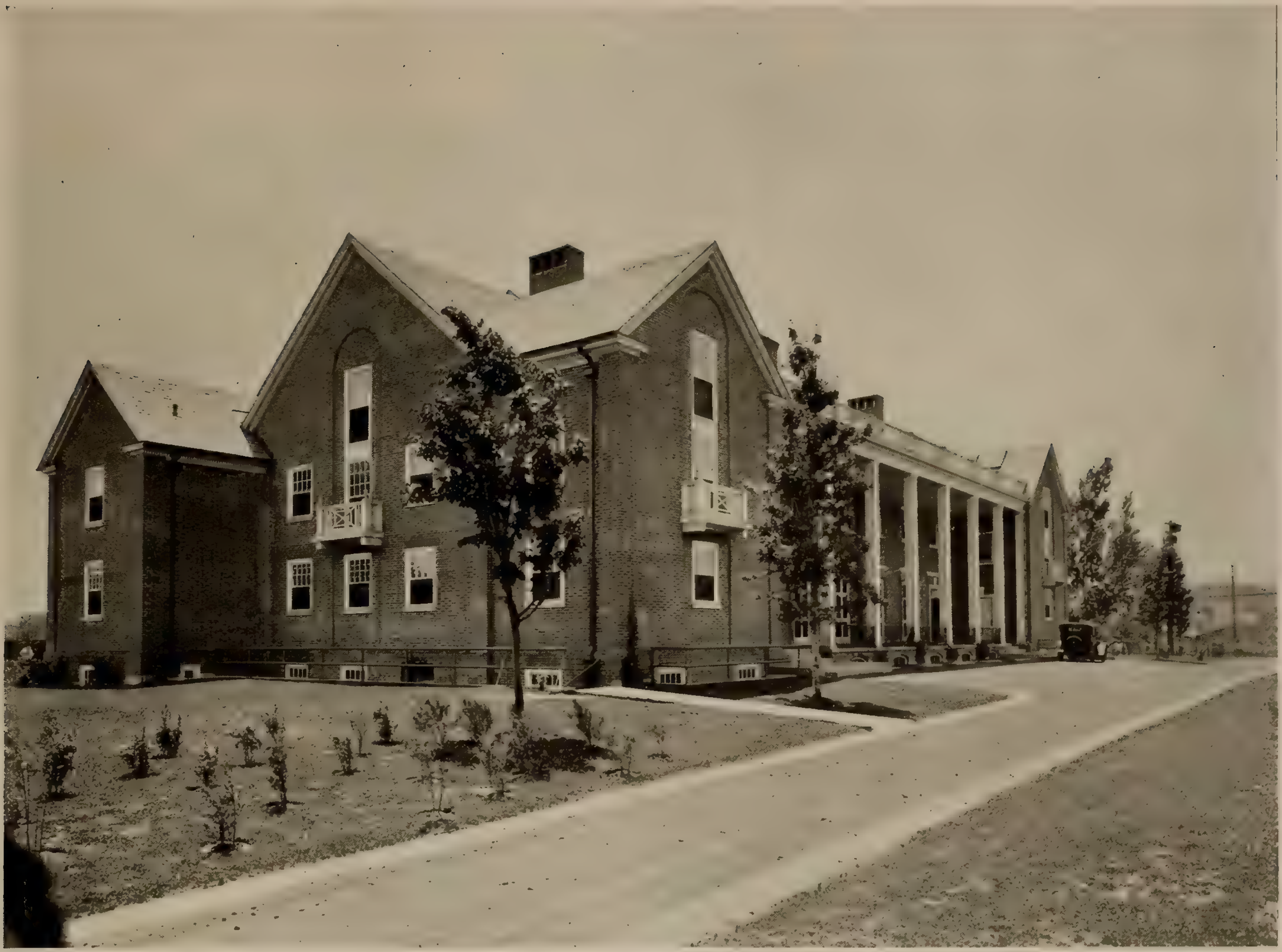
THAT apartment-houses can be built to yield a fair return on a rental basis of nine dollars a room has been amply demonstrated by the Metropolitan Life Insurance Company.

They tried the experiment as an after-war measure to help relieve the housing congestion, and the results offer interesting facts for the serious consideration of other investors. An item worth noting is that the loss from vacancies from July, 1924, to June 30, 1925, was only $406.54! The net returns for the twelve months were $681,181. Two thousand one hundred and twenty-five families were housed.

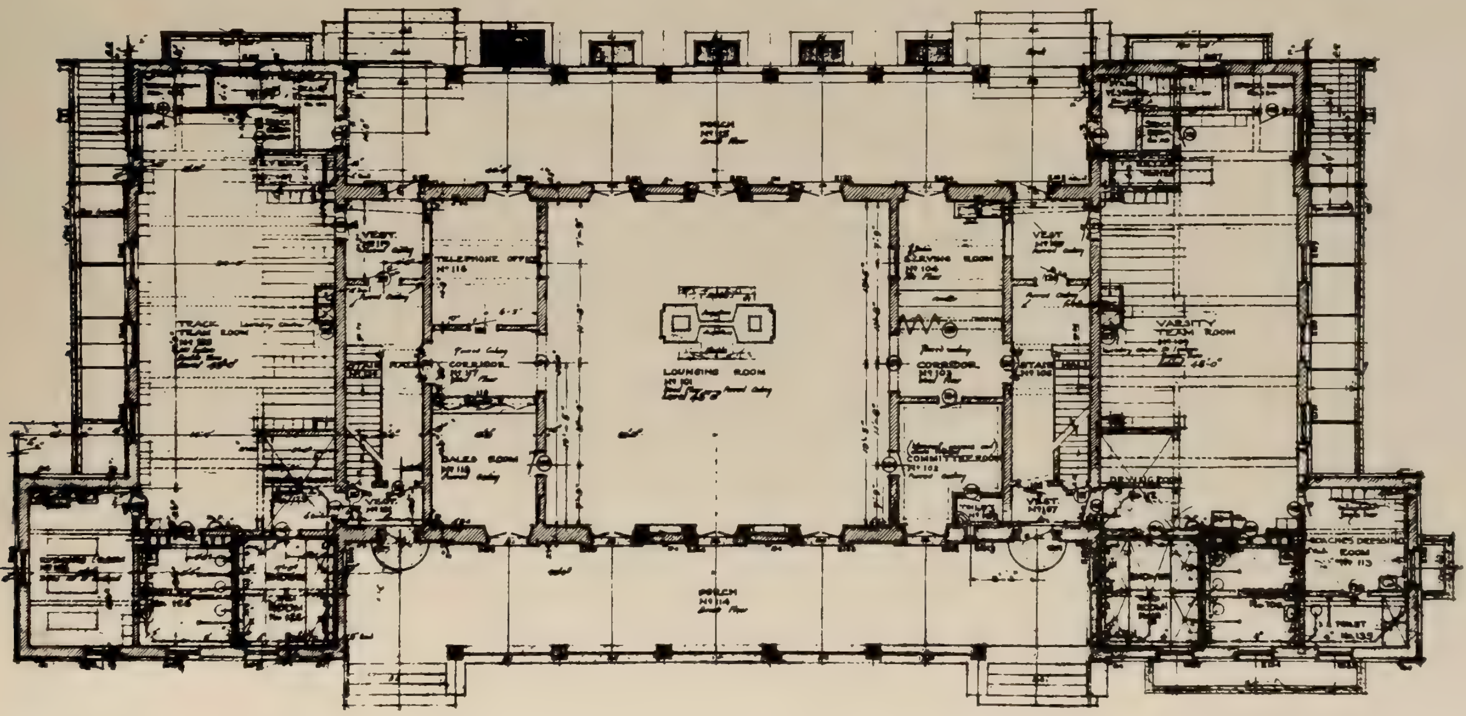


VIEW FROM SOUTHEAST, SHOWING FAÇADE AT LEFT FACING DERBY AVENUE. Day & Klauder, Architects.

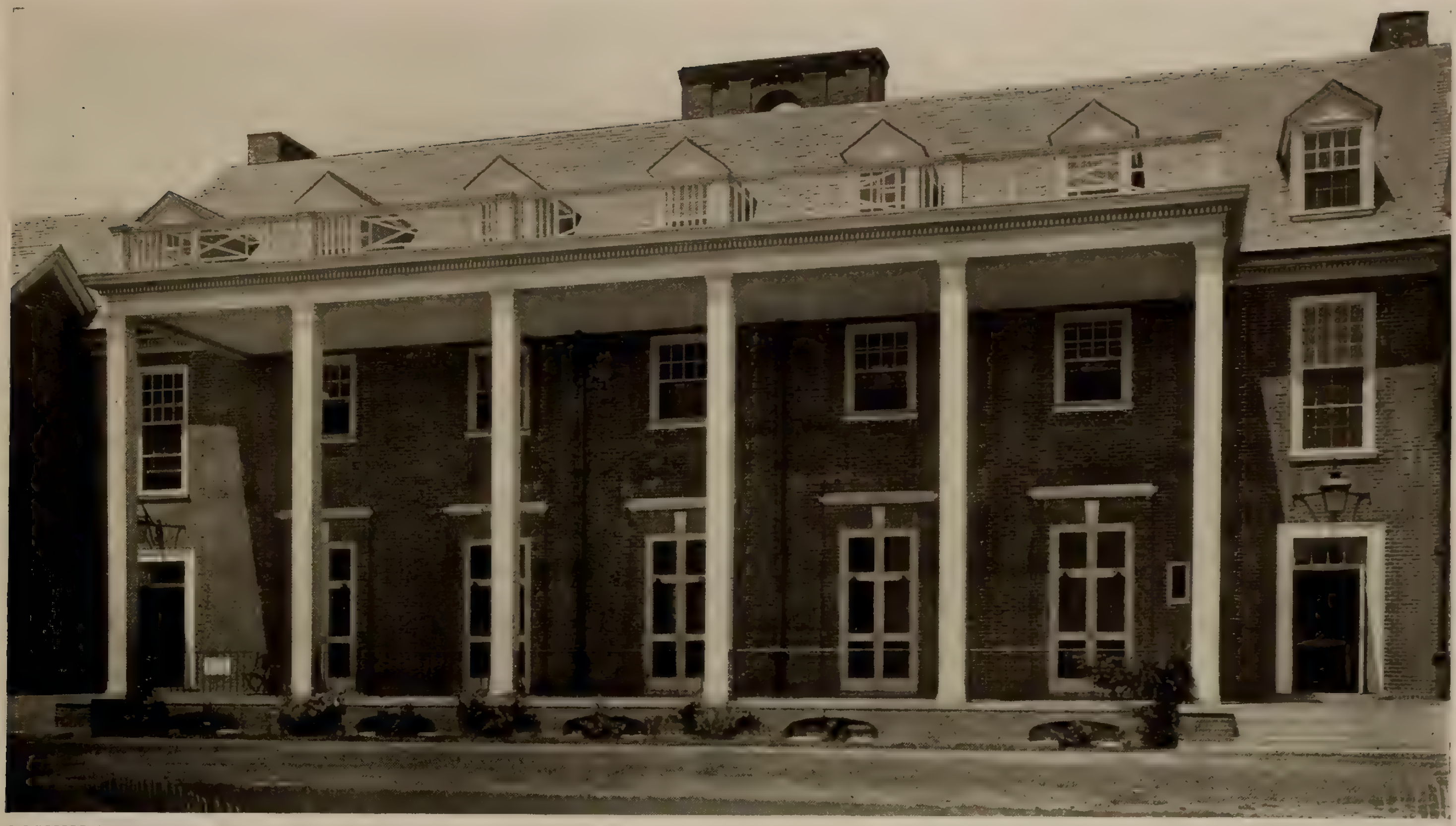
LAPHAM FIELD HOUSE, YALE UNIVERSITY, NEW HAVEN, CONN.



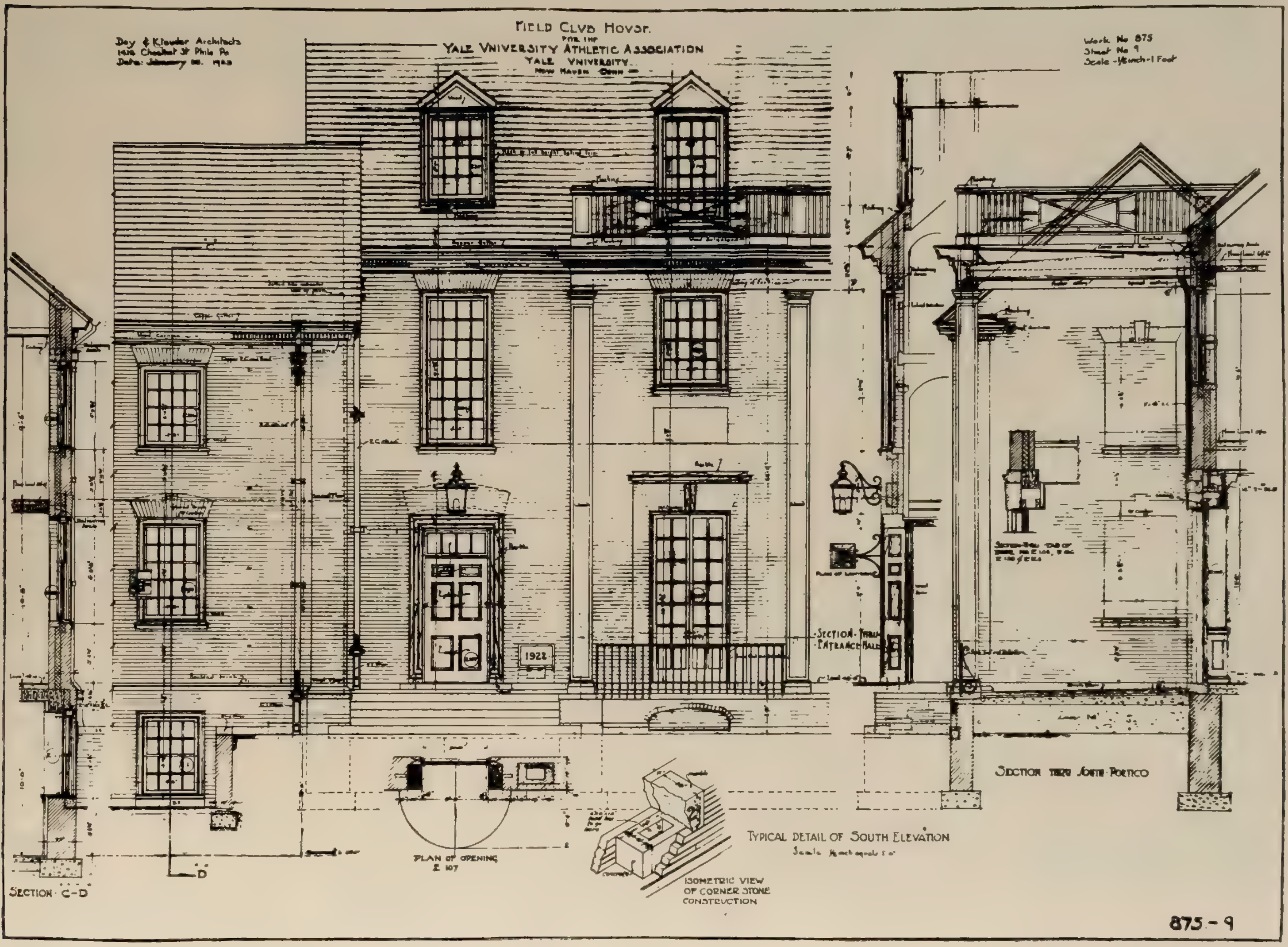
VIEW FROM THE NORTHEAST, SHOWING FAÇADE FACING THE TENNIS-COURTS.



LAPHAM FIELD HOUSE, YALE UNIVERSITY, NEW HAVEN, CONN. Day & Klauder, Architects.



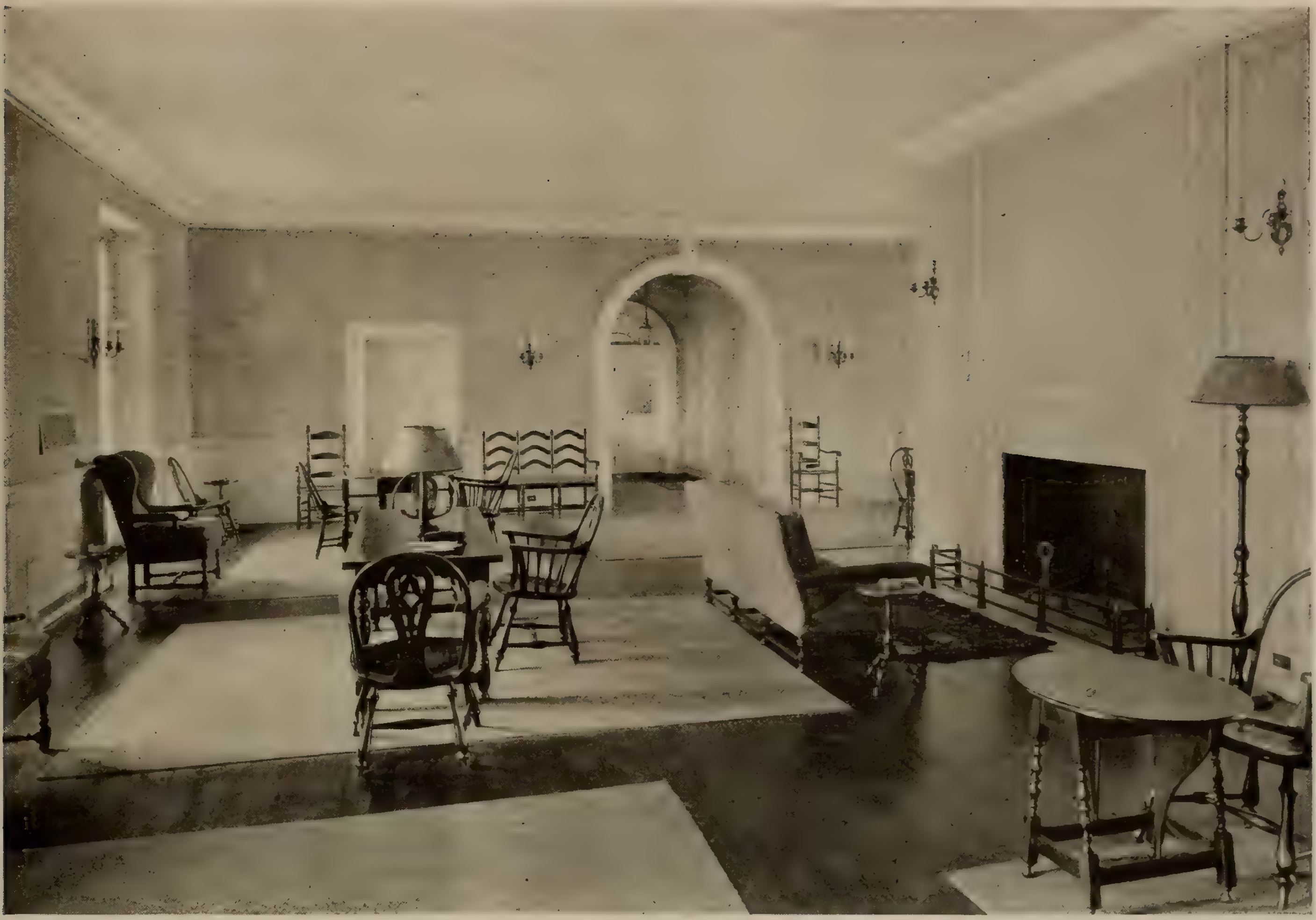
SOUTH VERANDA.



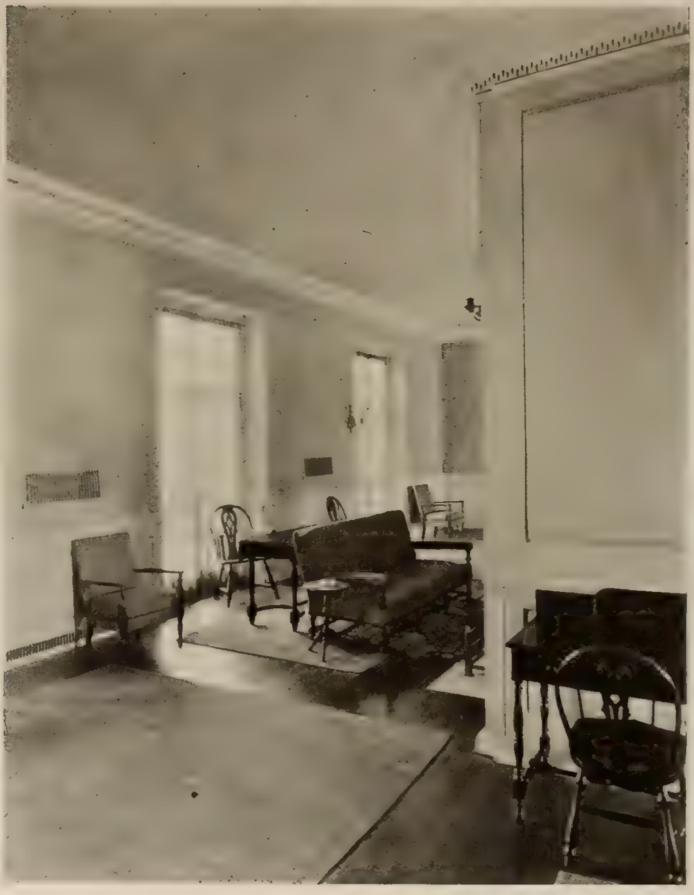
DETAIL OF SOUTH ELEVATION.

Day & Klauder, Architects.

LAPHAM FIELD HOUSE, YALE UNIVERSITY, NEW HAVEN, CONN.

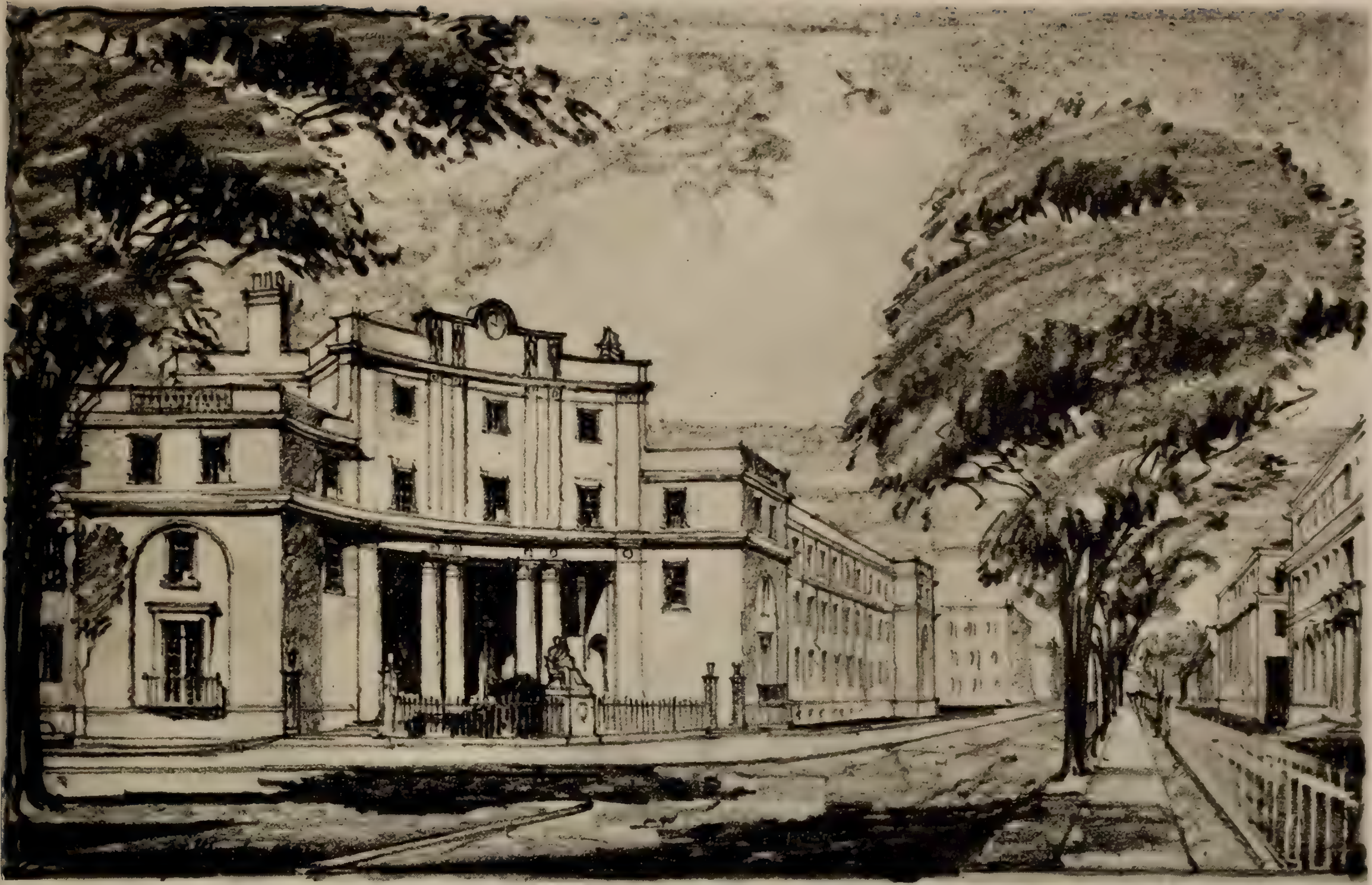


The living-room as divided by the central free-standing chimney-stack with a fireplace on each side. Simple furnishing and excellent decorative details distinguish this room. It opens on both north and south verandas through full-length casements.

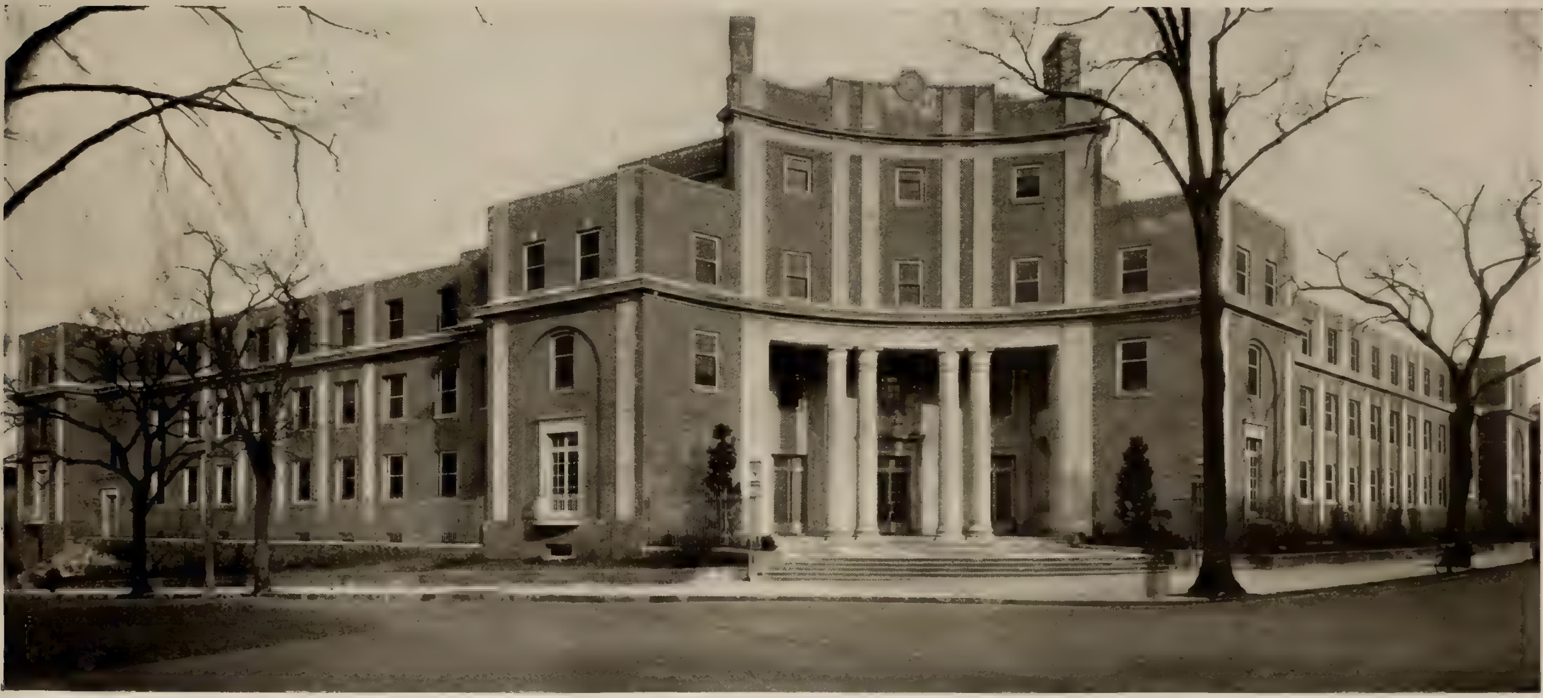


LAPHAM FIELD HOUSE, YALE UNIVERSITY, NEW HAVEN, CONN.

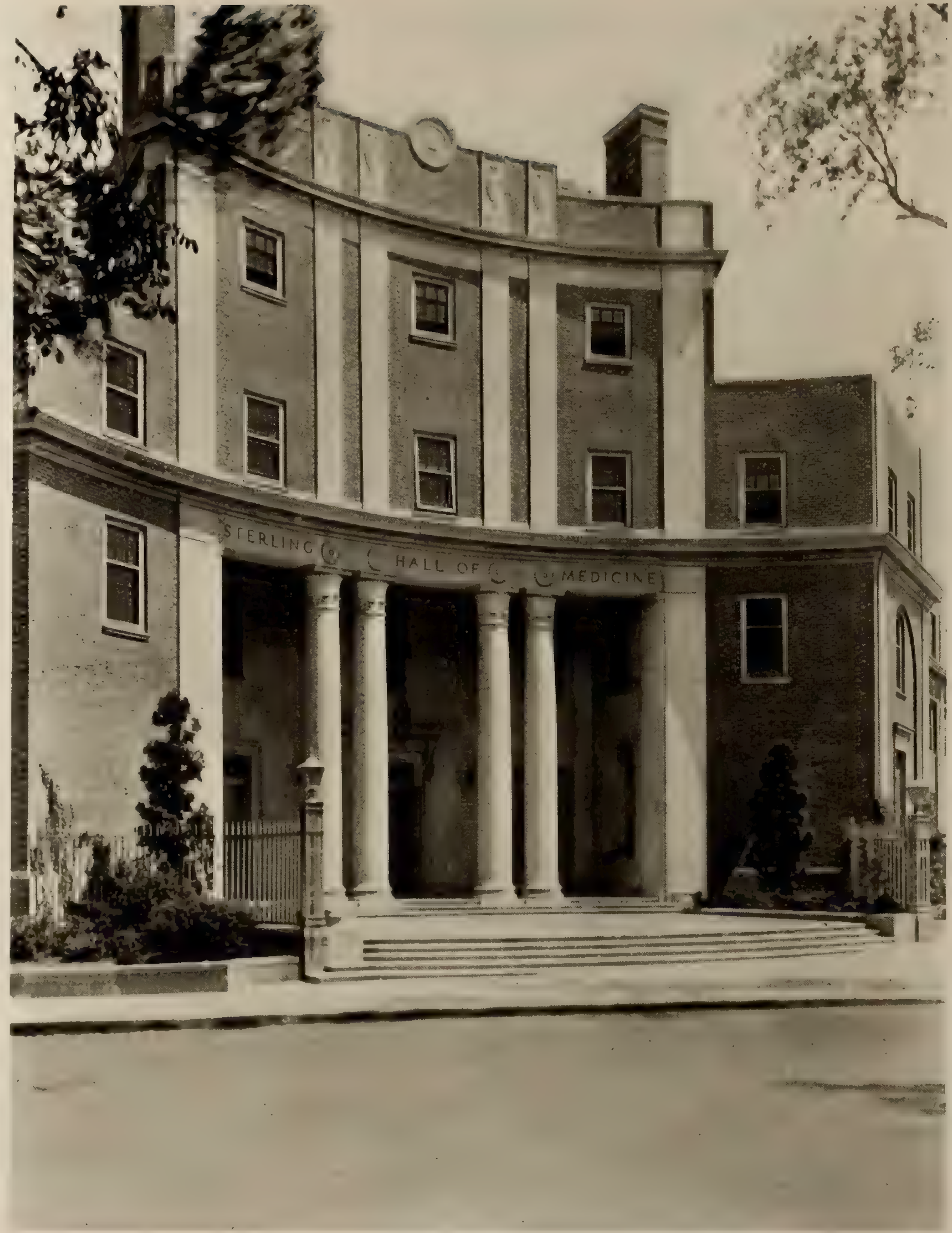
Day & Klauder, Architects.



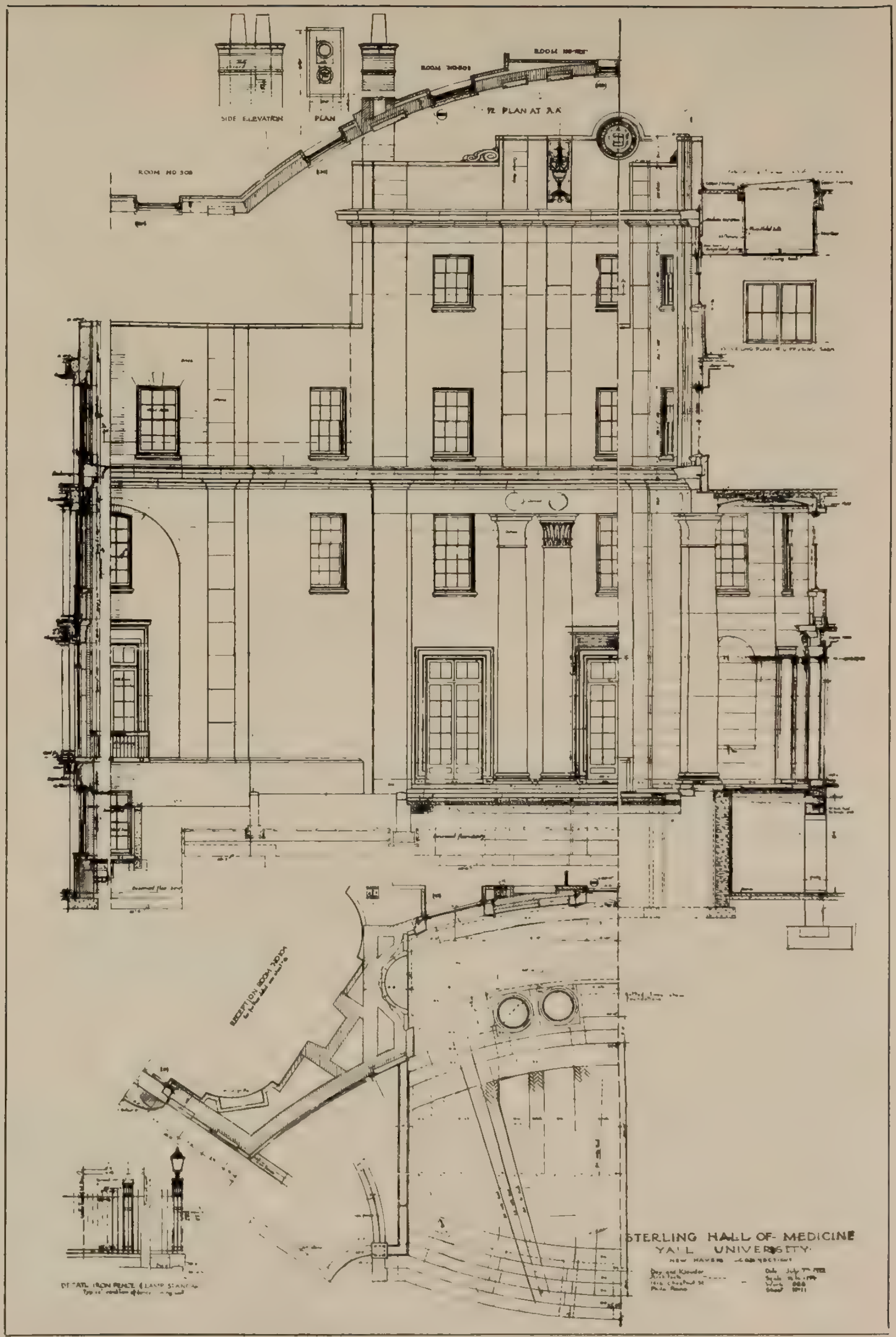
SKETCH BY MR. KLAUDER.



THE STERLING HALL OF MEDICINE, YALE UNIVERSITY, NEW HAVEN, CONN. Day & Klauder, Architects.

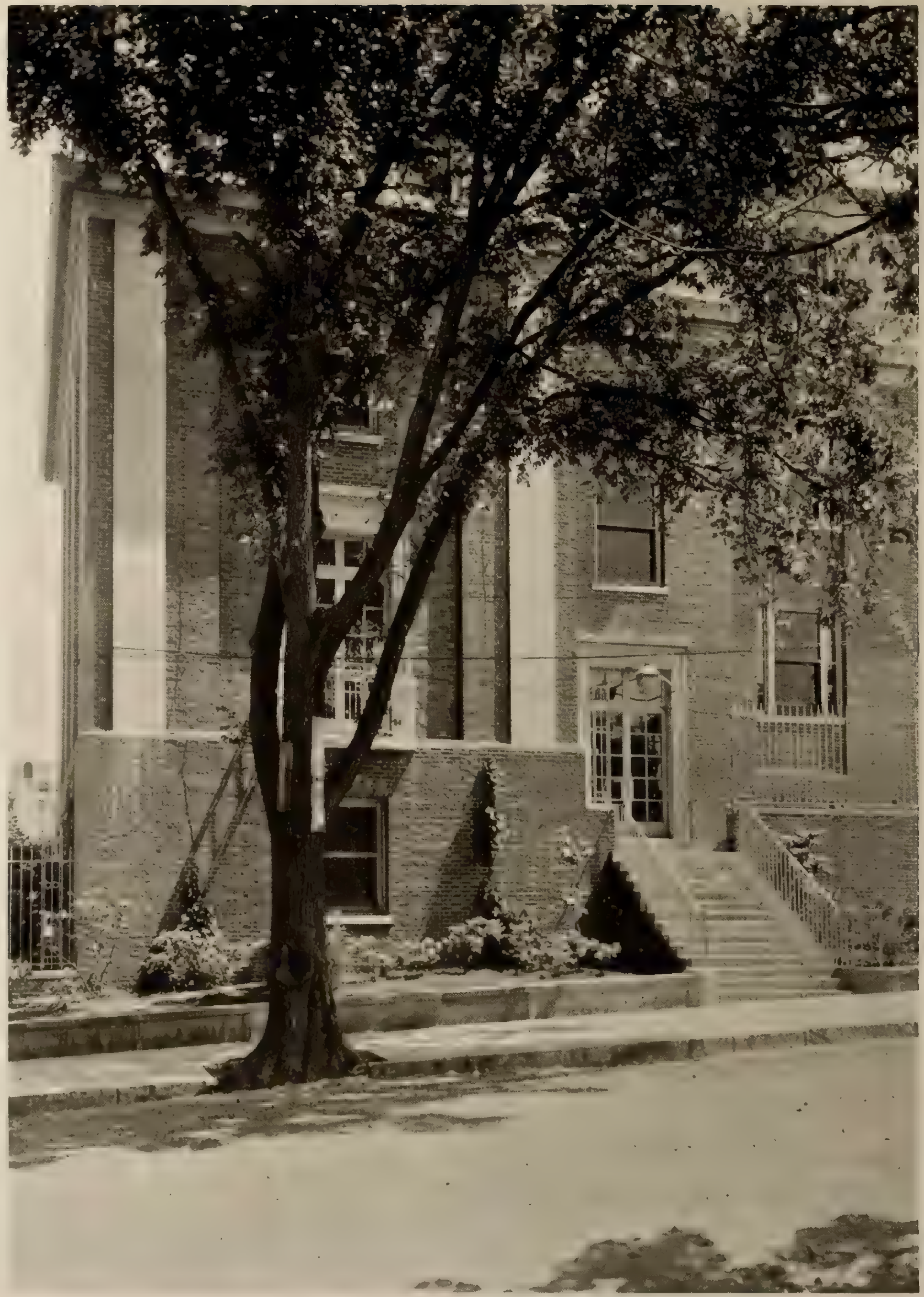


MAIN PAVILION AND ENTRANCE, CORNER CEDAR AND BROAD STREETS.

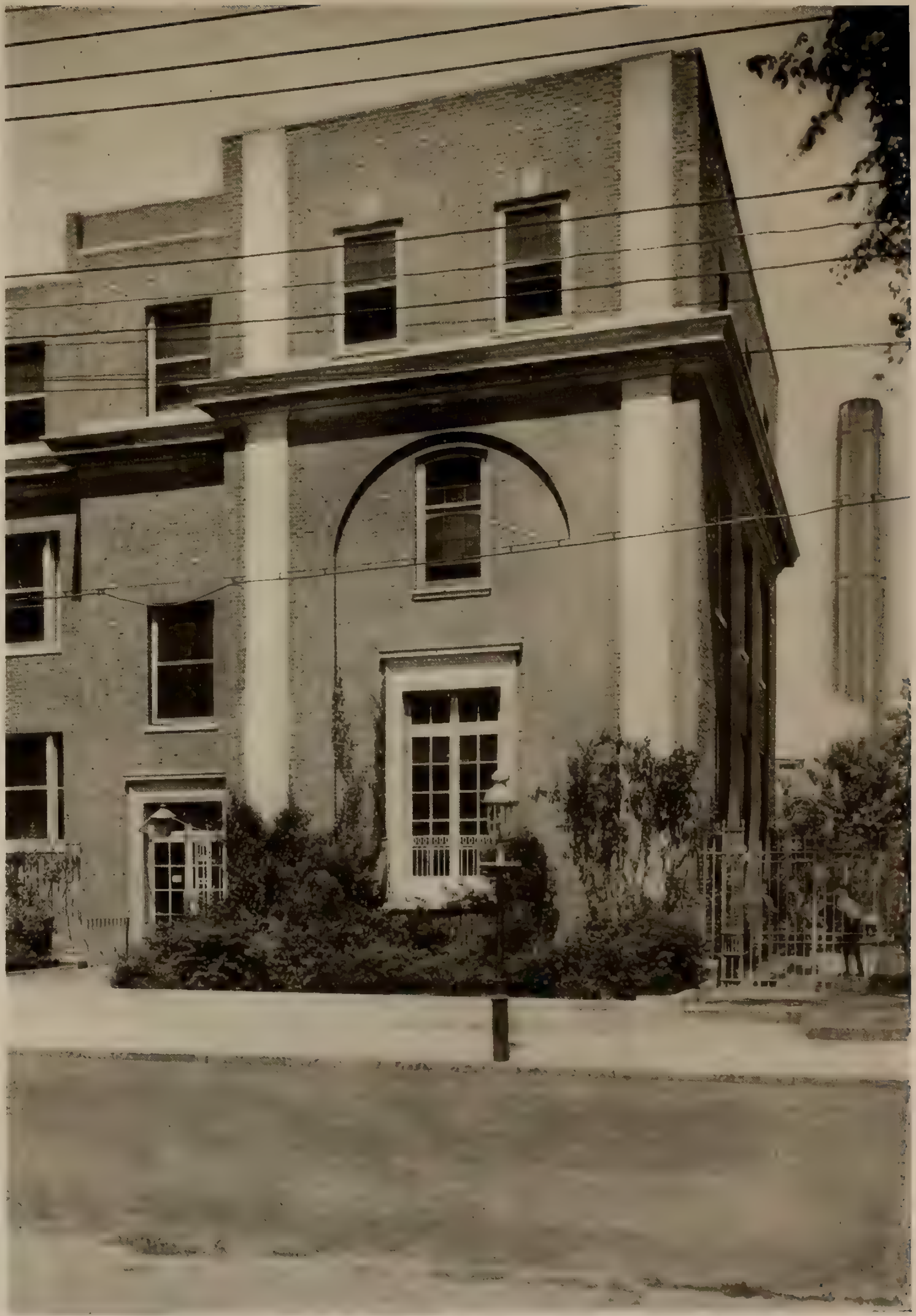


Day & Klauder, Architects.

THE STERLING HALL OF MEDICINE, YALE UNIVERSITY, NEW HAVEN, CONN.

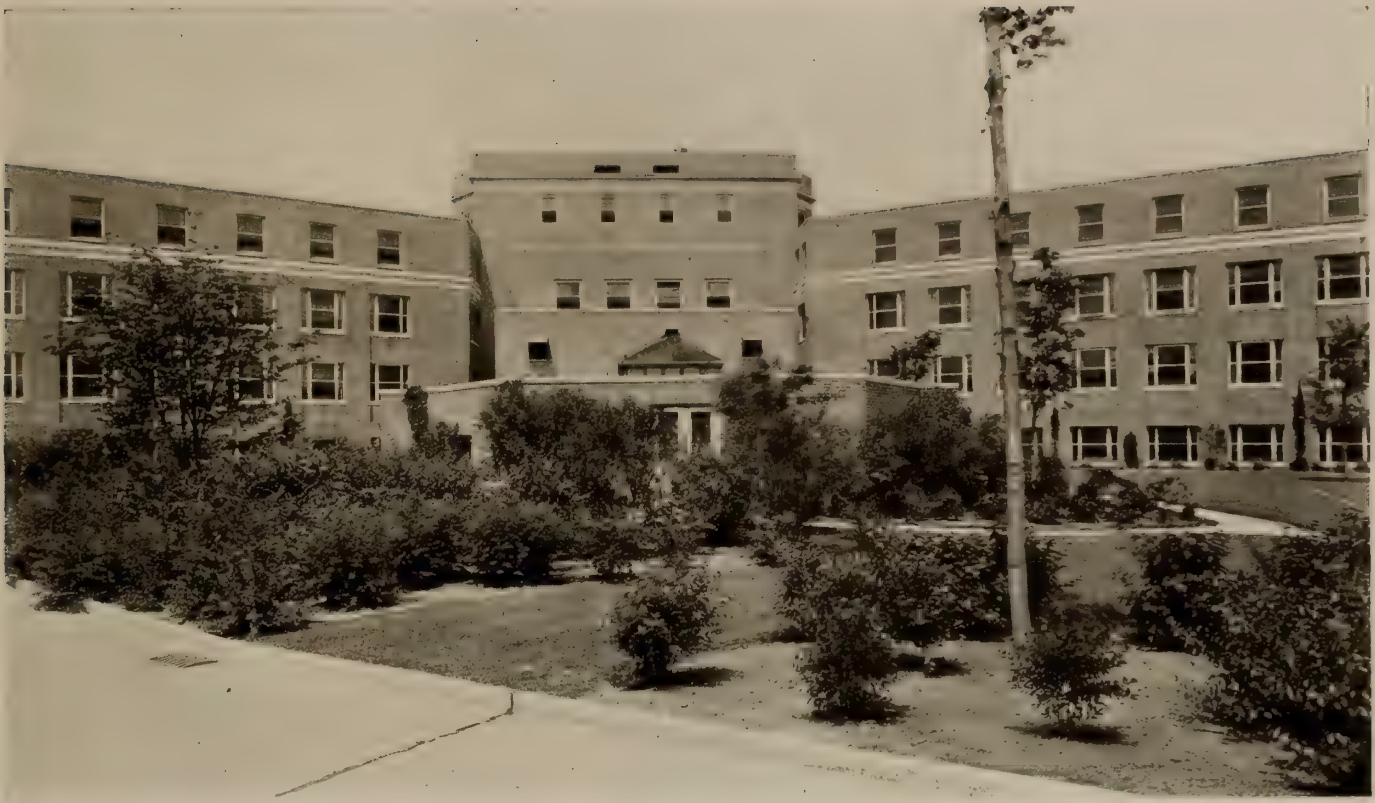


PAVILION AND EXIT AT NORTHEAST END OF BROAD STREET WING.

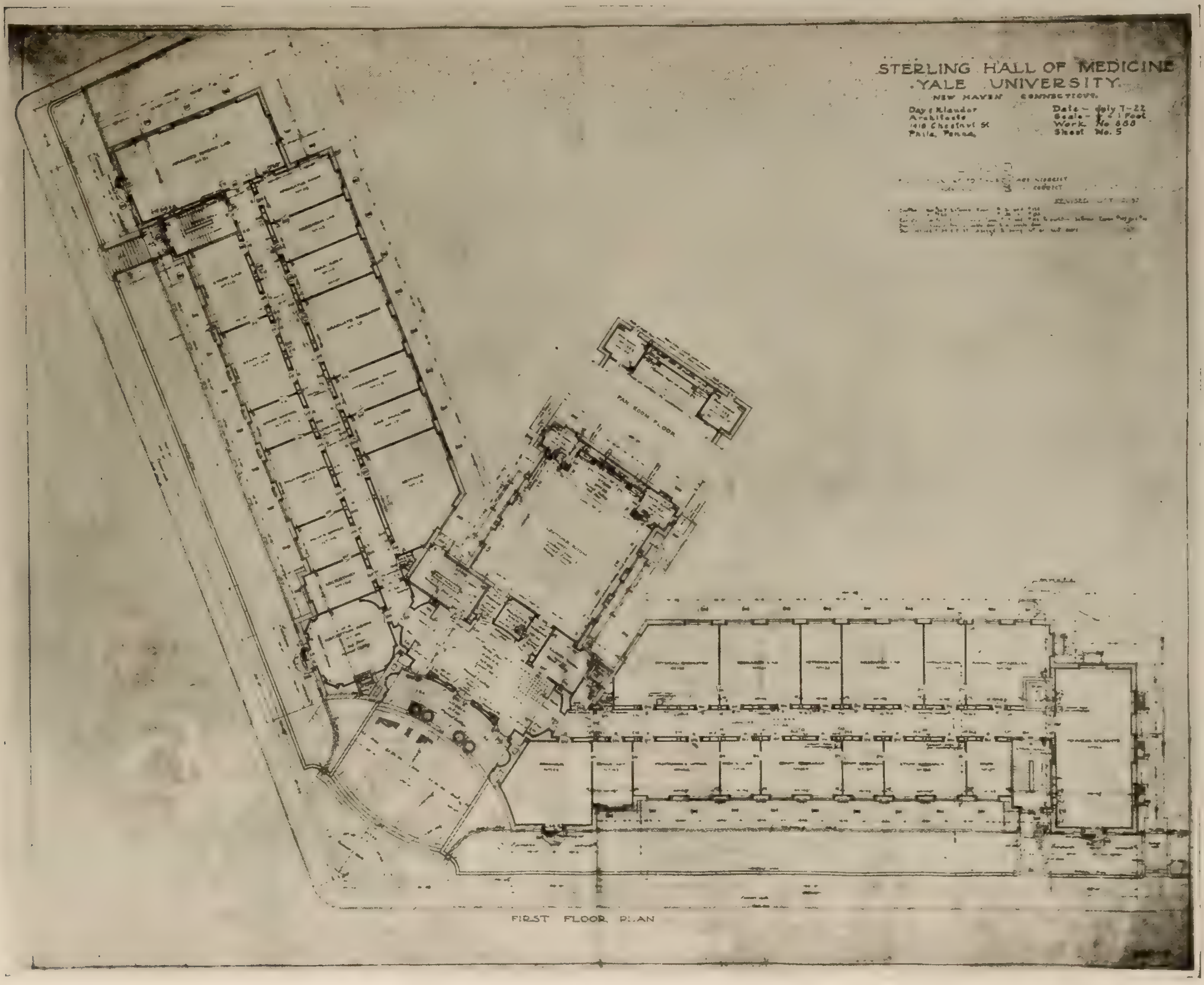


PAVILION AND EXIT AT SOUTH END OF CEDAR STREET WING.

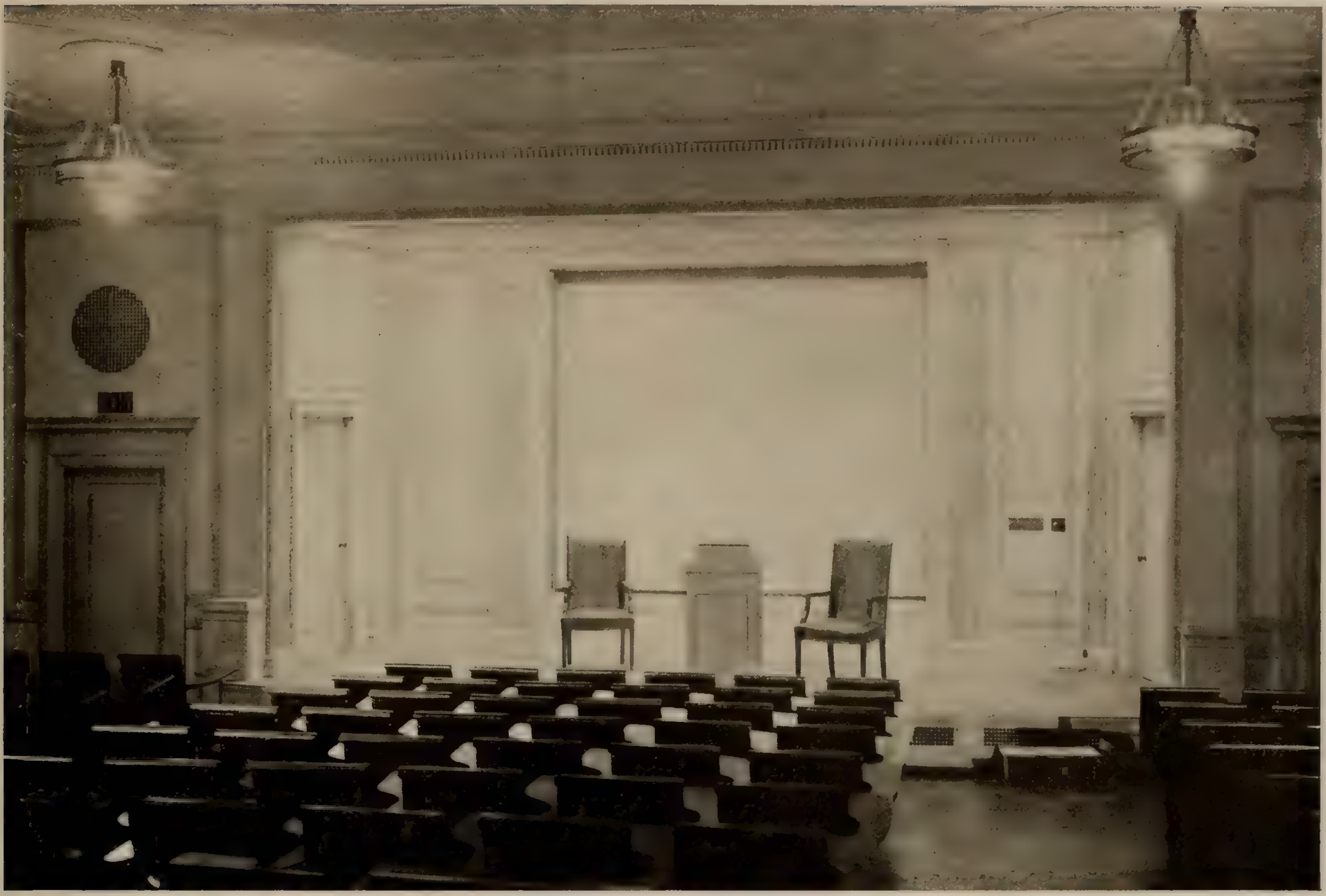
THE STERLING HALL OF MEDICINE, YALE UNIVERSITY, NEW HAVEN, CONN.
Day & Klauder, Architects.



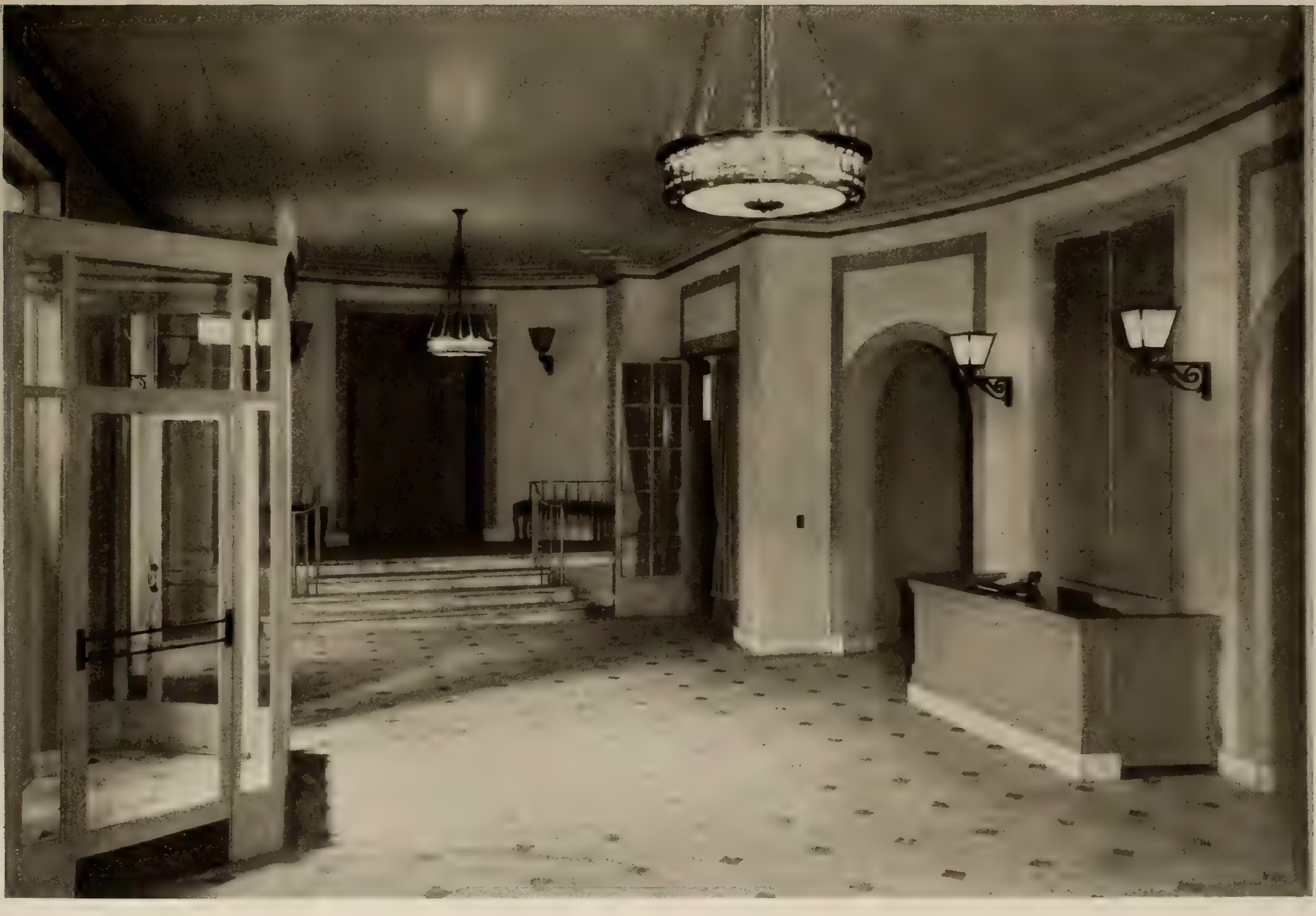
VIEW FROM THE GROUNDS, SHOWING THE BACKS OF THE TWO WINGS. THE LOW WING IN THE FOREGROUND IS THE ANIMAL RETENTION HOUSE.



STERLING HALL OF MEDICINE, YALE UNIVERSITY, NEW HAVEN, CONN. Day & Klauder, Architects.

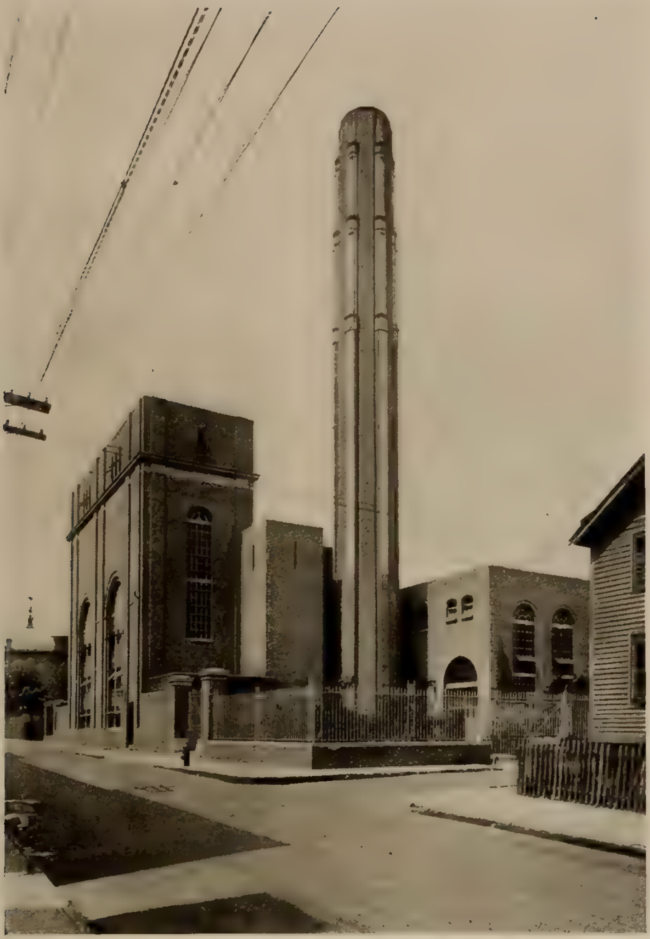


LECTURE–HALL.

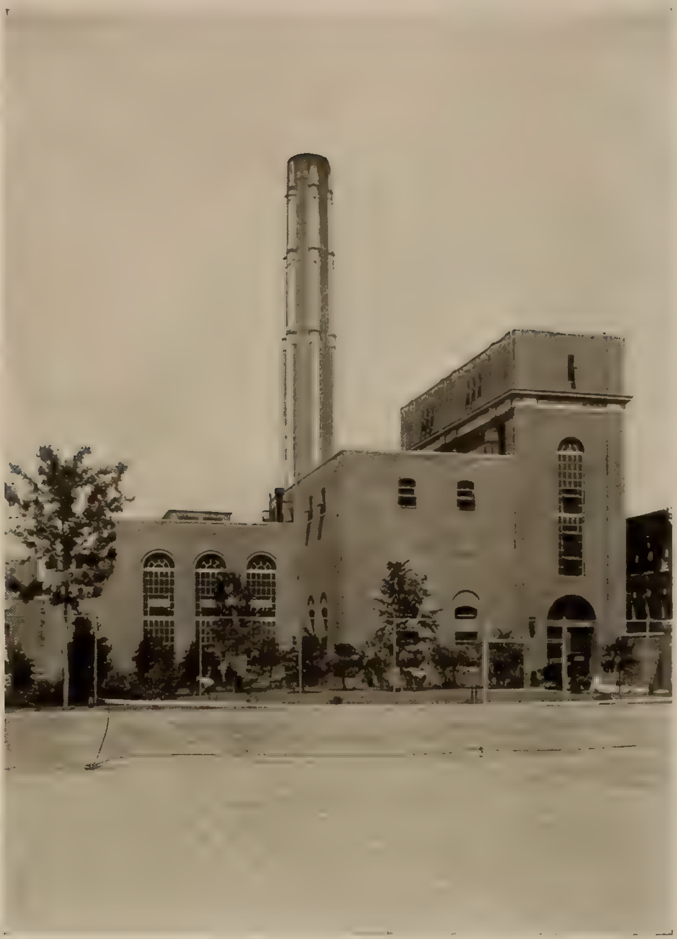


ENTRANCE–HALL. ENTRANCES TO LECTURE–HALL AT THE RIGHT. Day & Klauder, Architects.

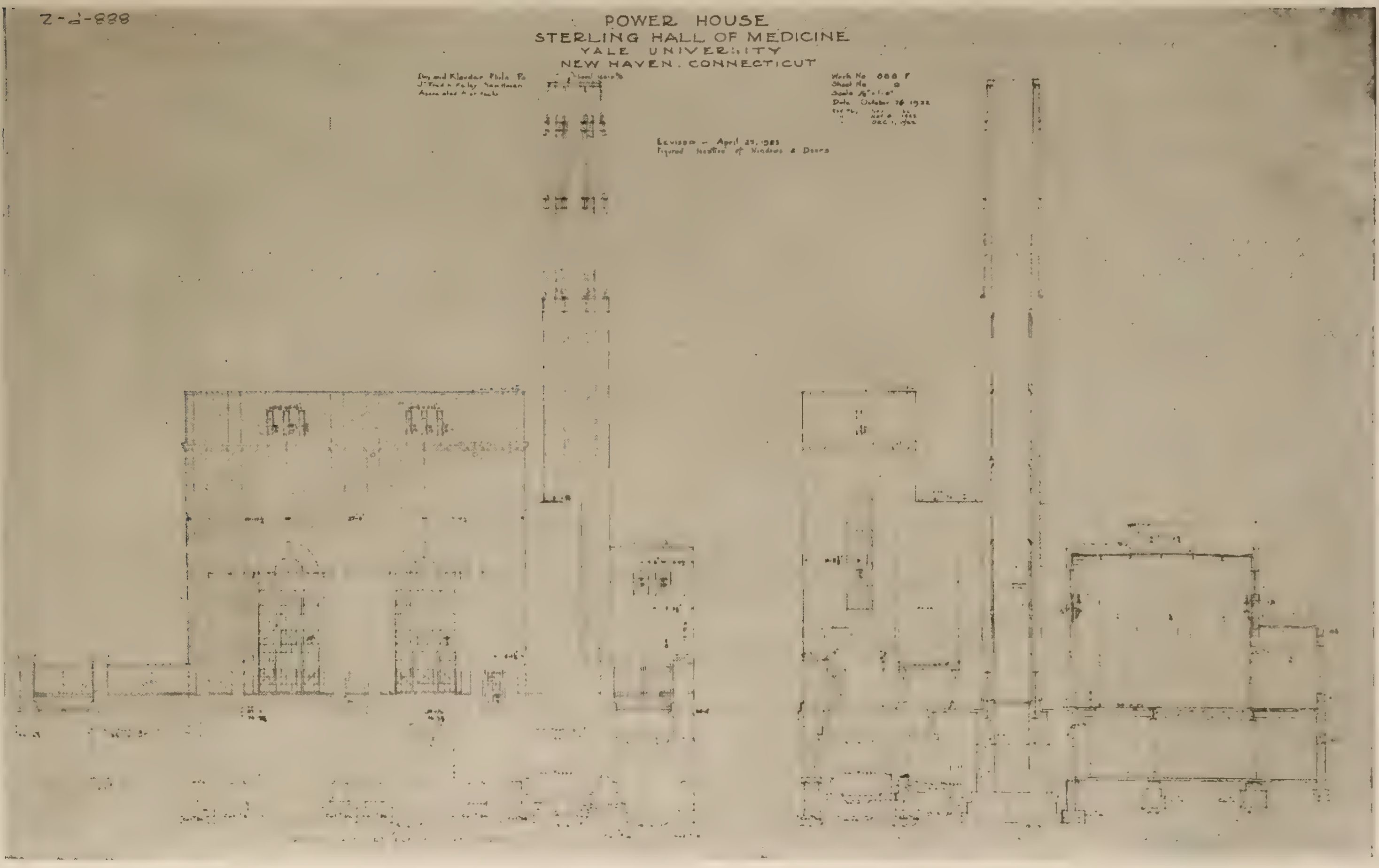
THE STERLING HALL OF MEDICINE, YALE UNIVERSITY, NEW HAVEN, CONN.



VIEW FROM ROSE STREET, NORTHEAST.

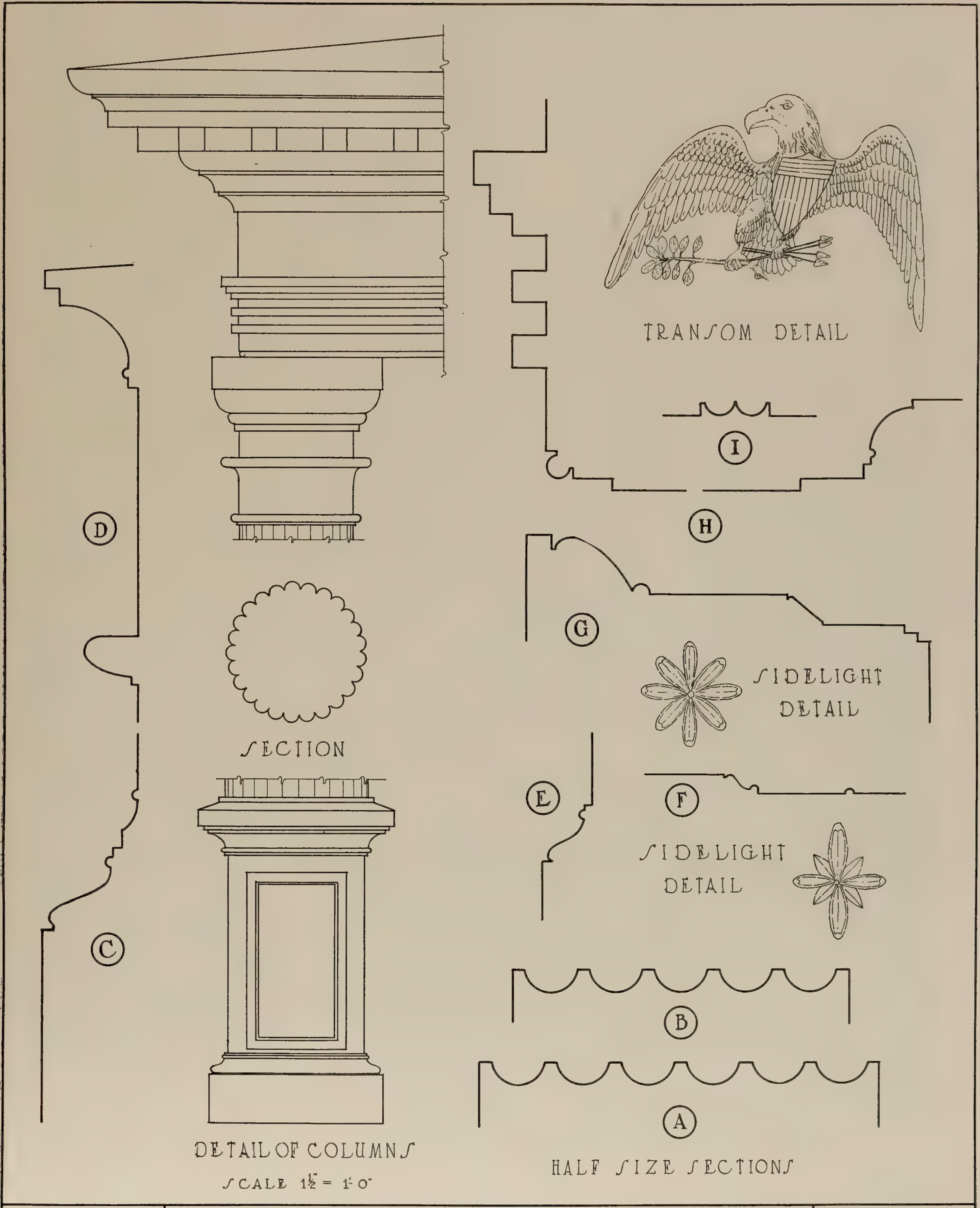


VIEW FROM THE GROUNDS, NORTHWEST.



POWER–HOUSE. Day & Klauder, Architects.

STERLING HALL OF MEDICINE, YALE UNIVERSITY, NEW HAVEN, CONN.

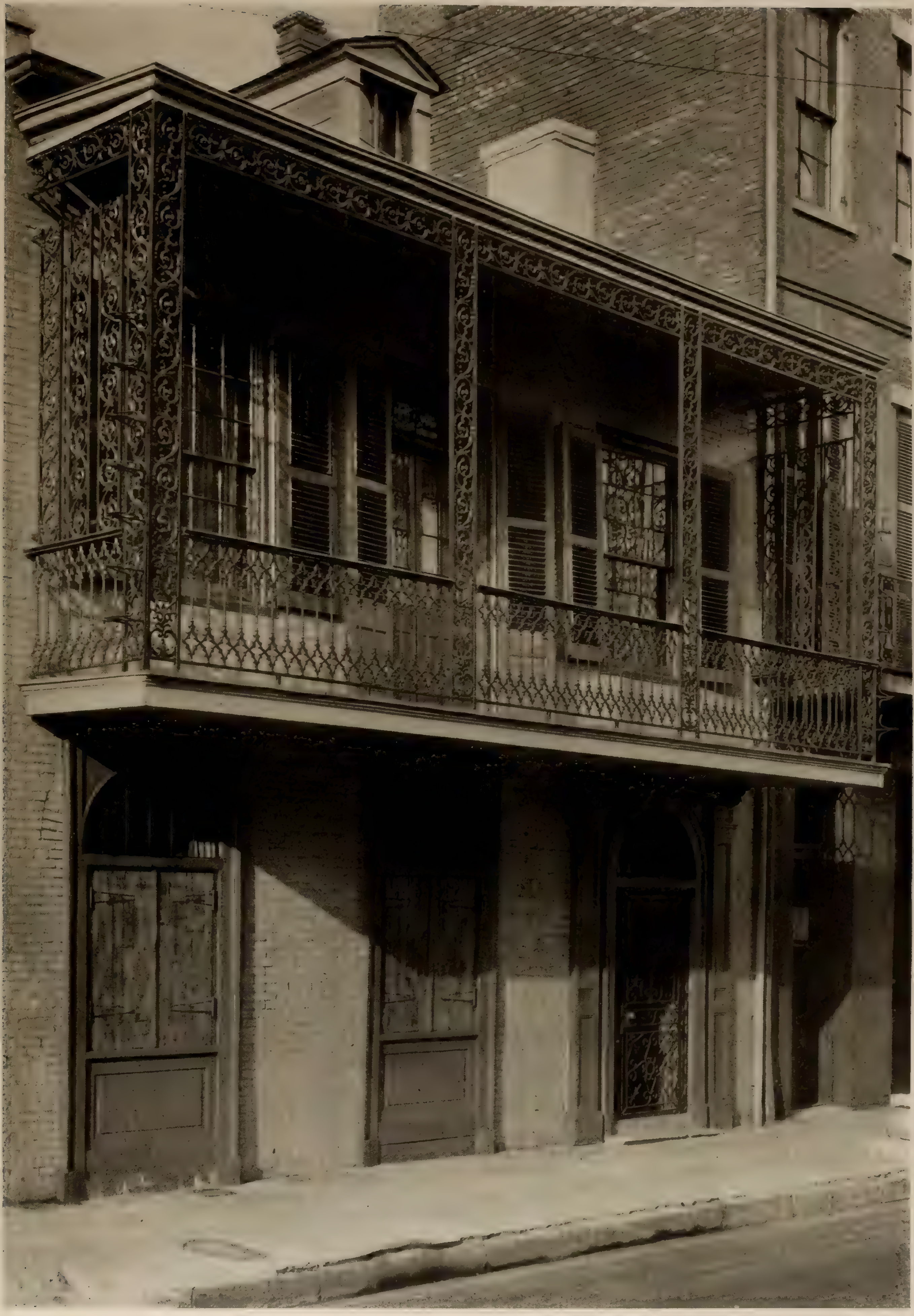


MAINE
COLONIAL
SERIES

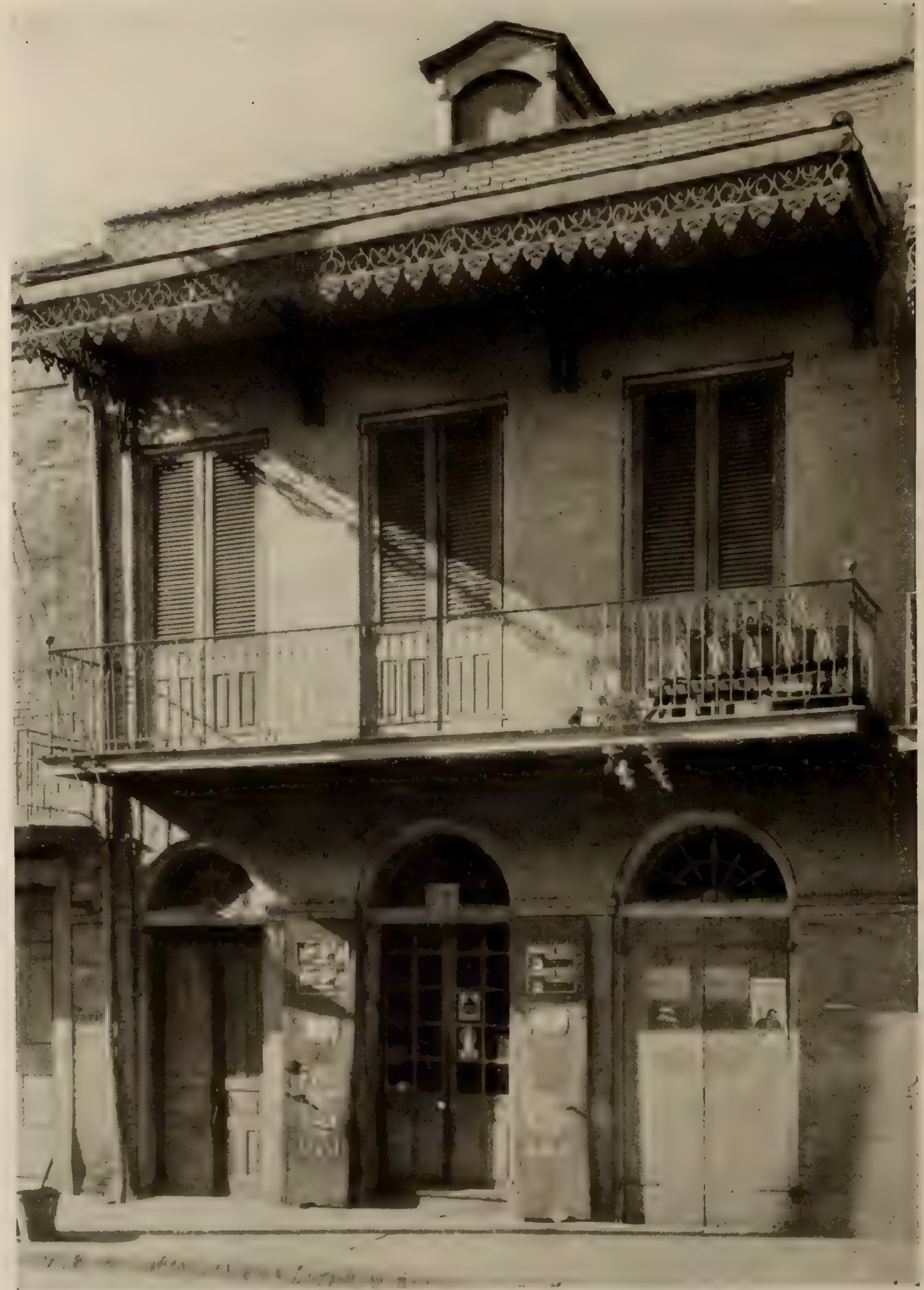
DOORWAY of the GENERAL VEAZIE HOVSE
TOPSHAM MAINE

BUILT IN 1800

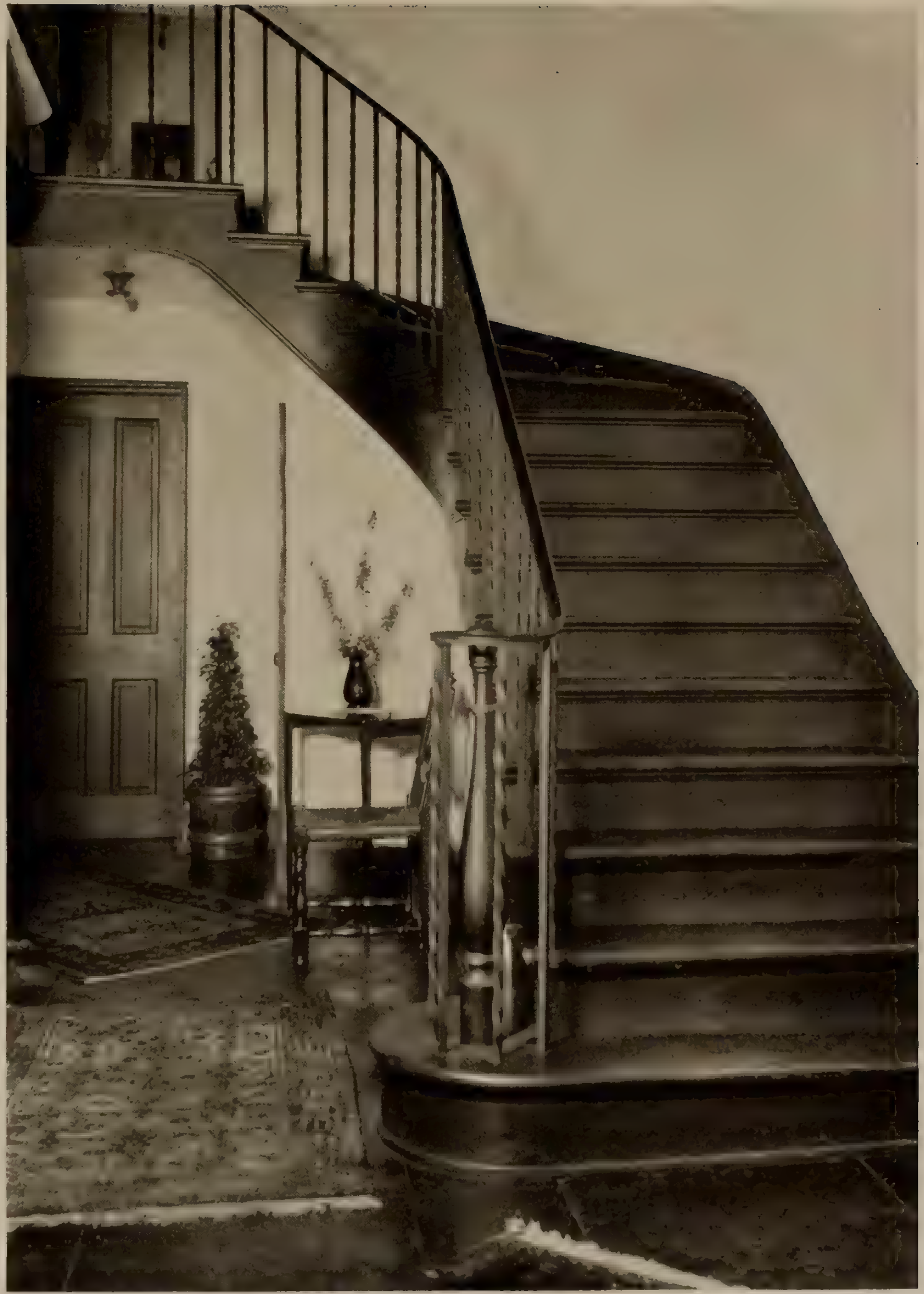
MEASURED AND
DRAWN BY
A. J. HARRIMAN.



ONE OF THE OLD HOUSES IN THE FRENCH QUARTER, NEW ORLEANS, LA.
Restoration and alteration by Moise Goldstein, Architect.



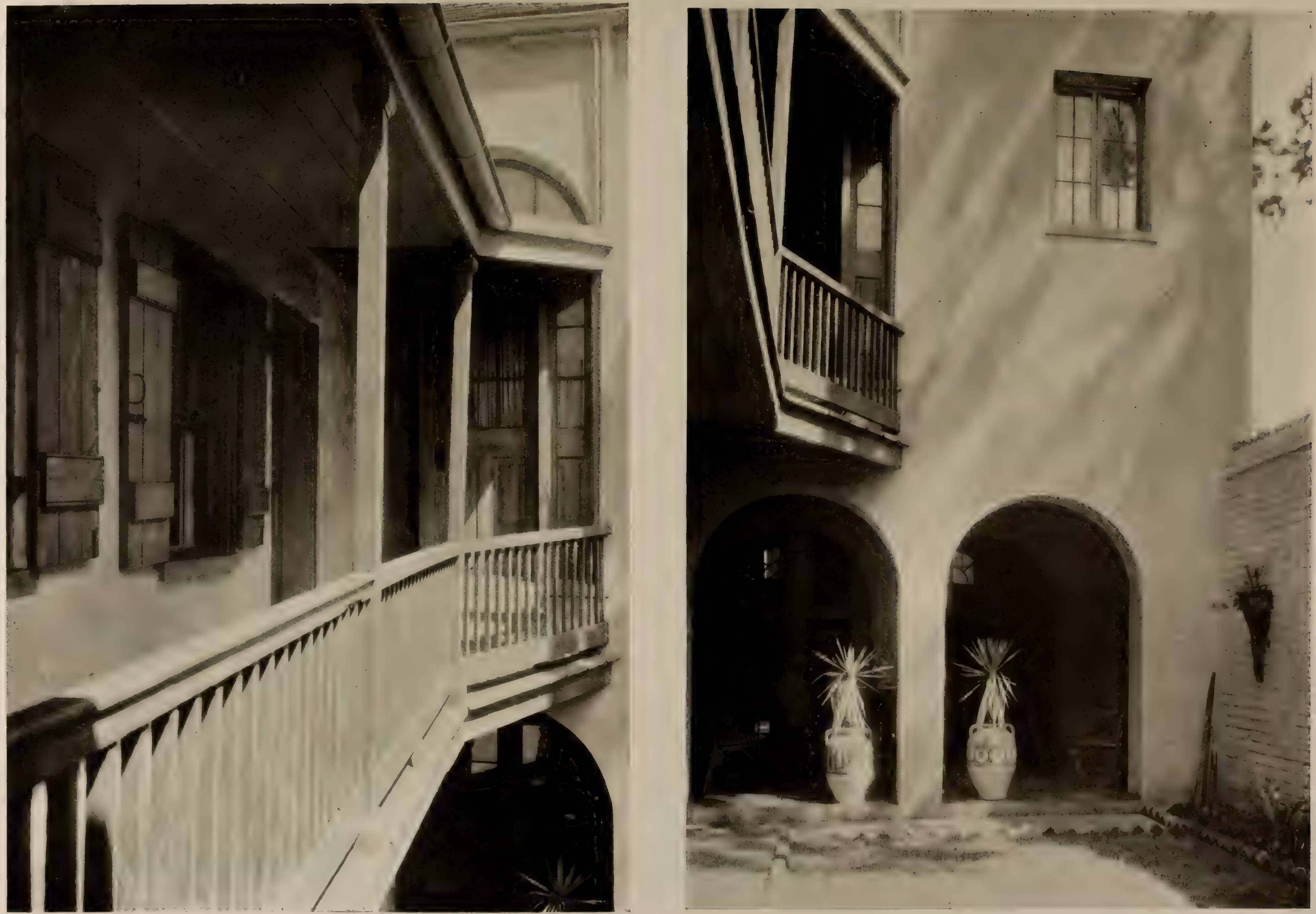
A HOUSE OF THE SAME TYPE BEFORE ALTERATION.



THE HALL AND STAIRWAY OF HOUSE.

HOUSE IN THE FRENCH QUARTER, NEW ORLEANS, LA.

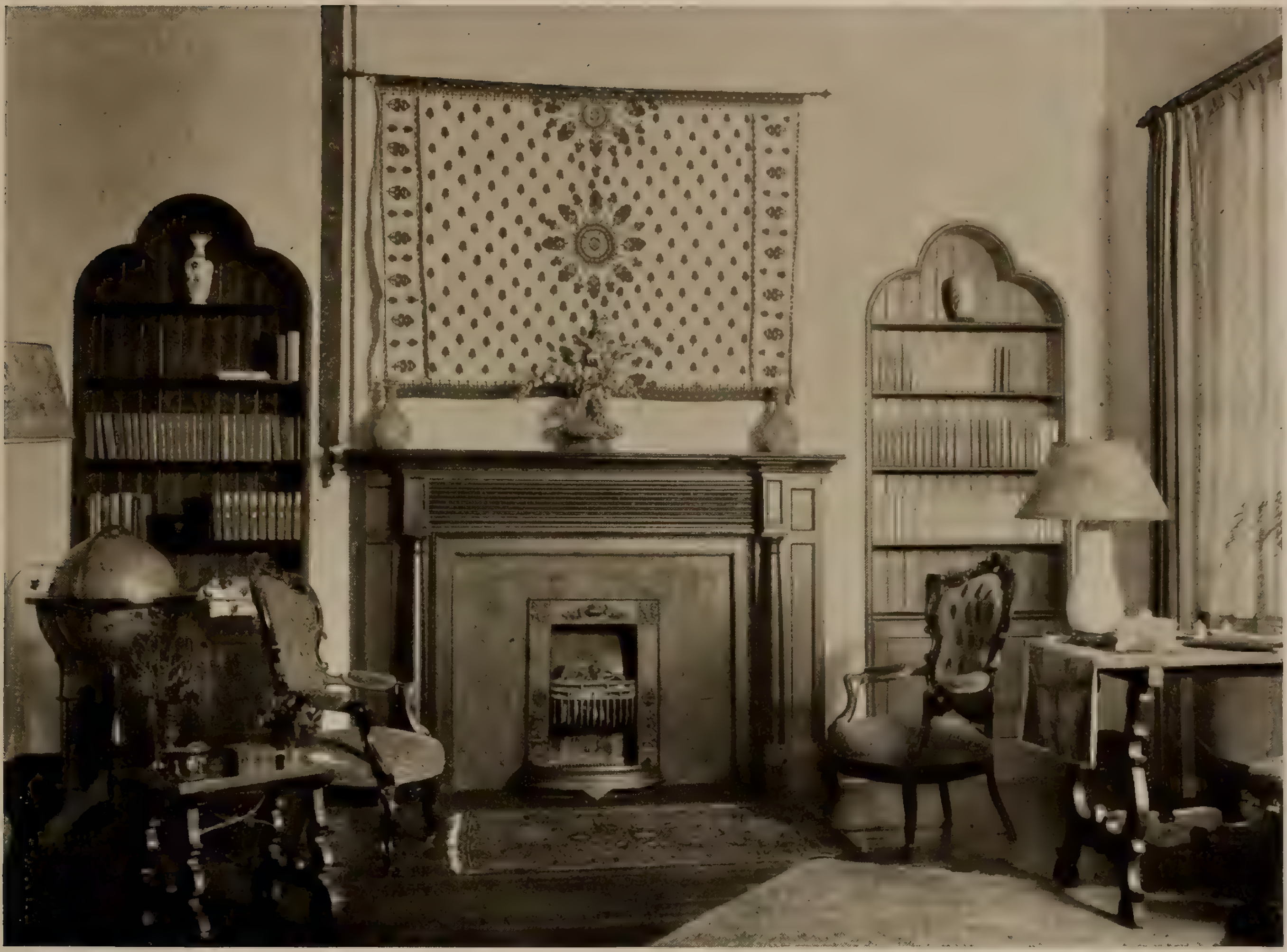
Restoration and alteration by Moise Goldstein, Architect.



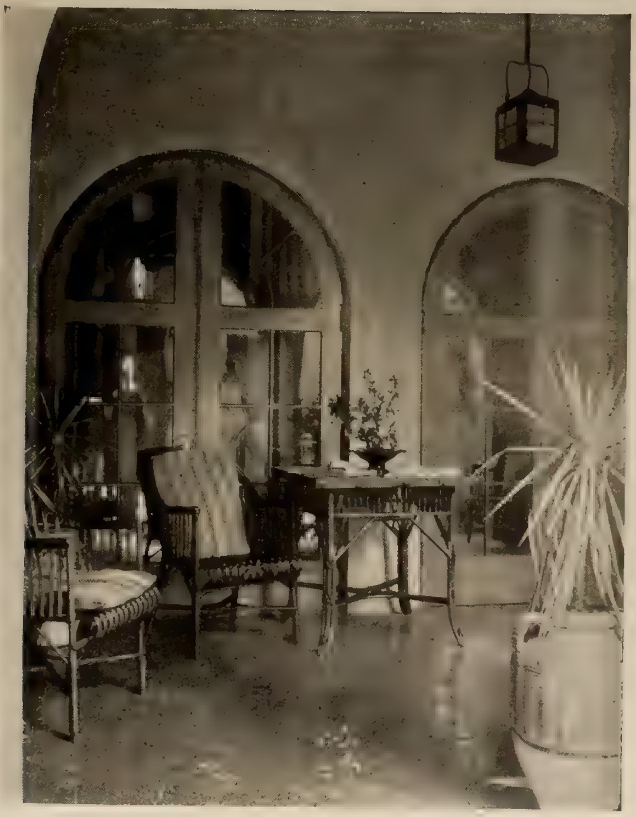
THE COURTYARD.

Restoration and alteration by Moise Goldstein, Architect.

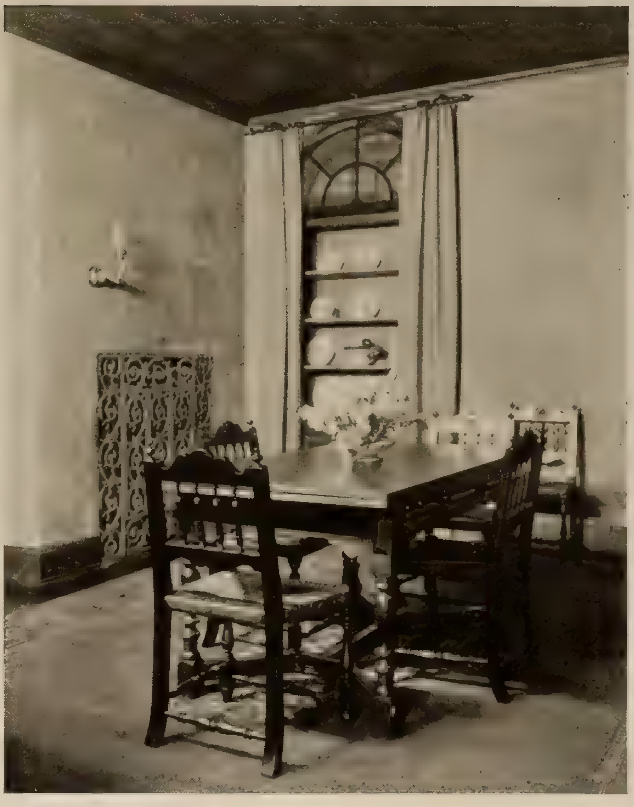
AN OLD HOUSE IN THE FRENCH QUARTER, NEW ORLEANS, LA.



LIVING–ROOM.

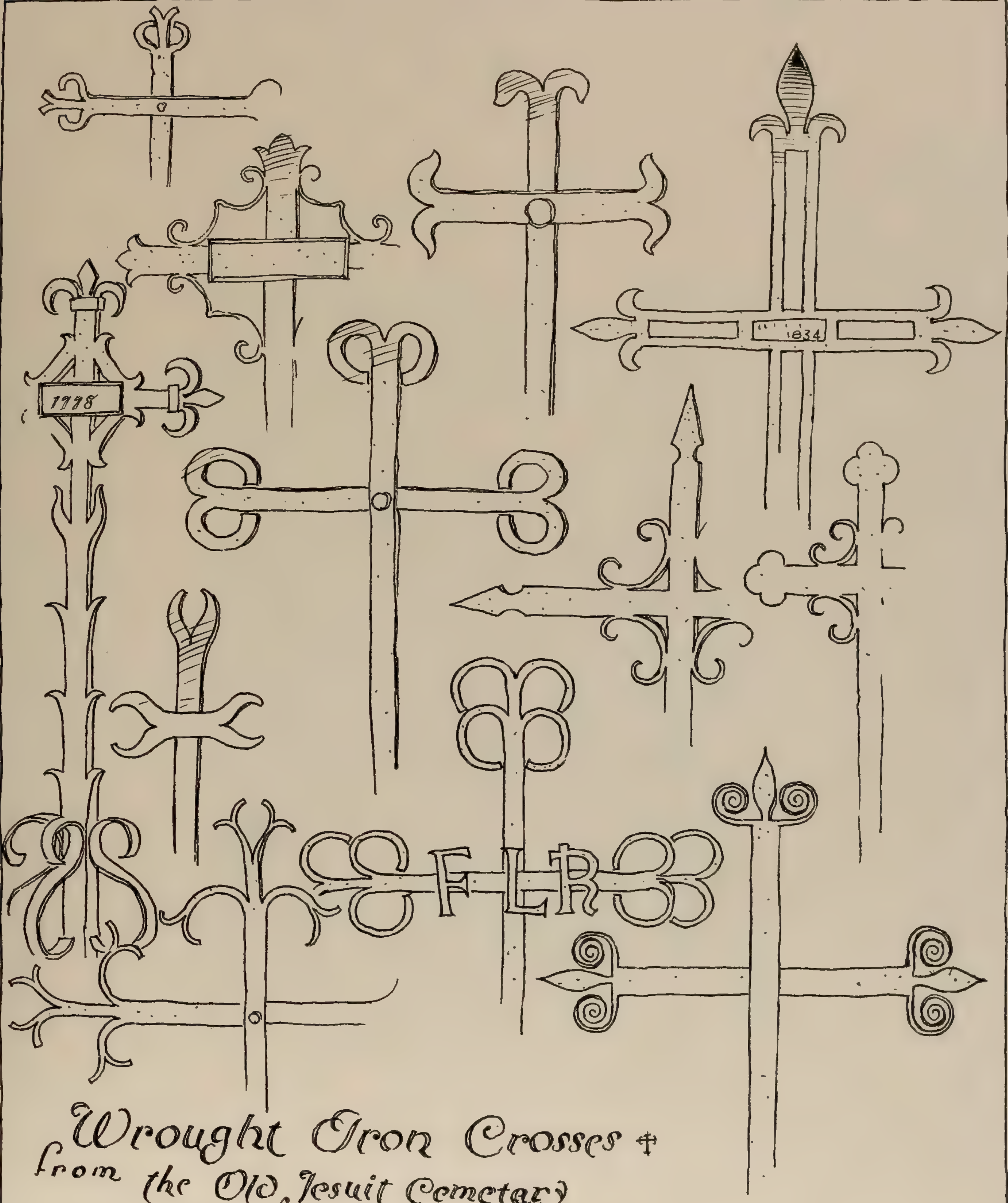


HALL.



DINING–ROOM.

OLD HOUSE IN FRENCH QUARTER, NEW ORLEANS, LA.
Restoration and alteration by Moise Goldstein, Architect.



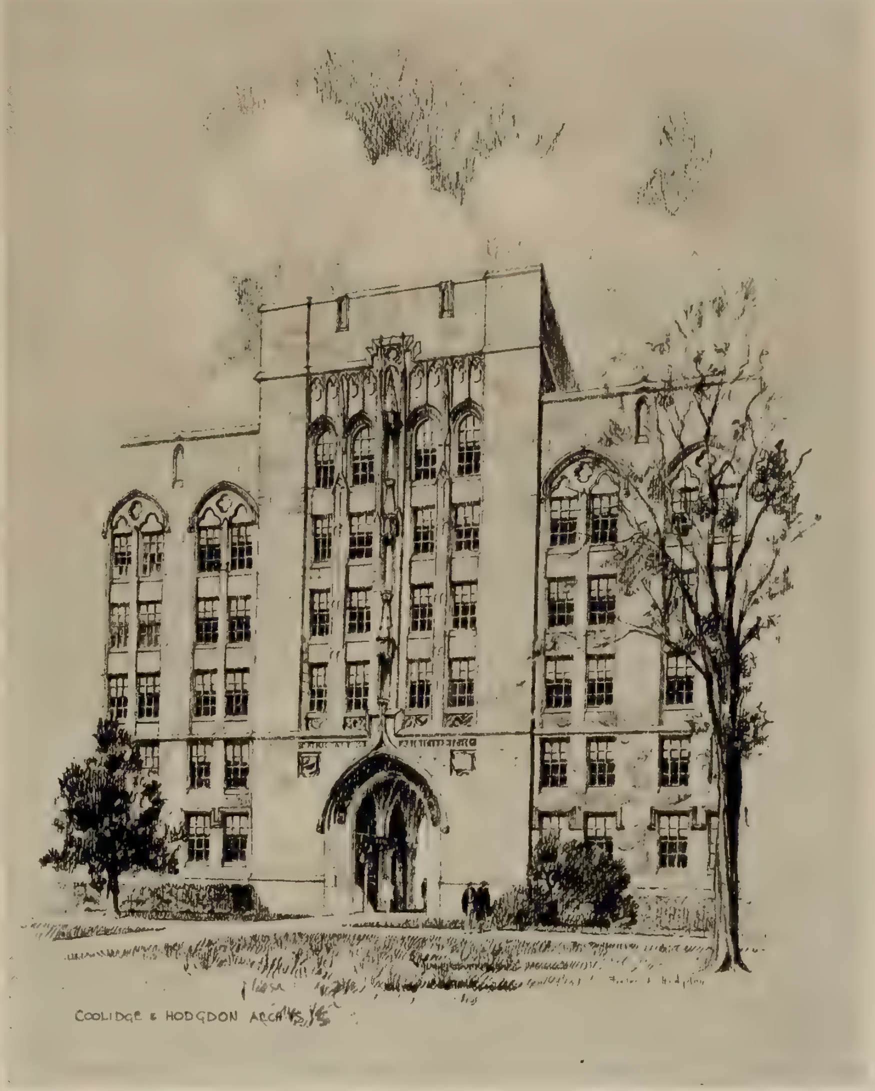
Wrought Iron Crosses ☩
from the Old Jesuit Cemetary
Grand Coteau
Louisiana ~

drawn by
William P. Spratling

The Medical Building and Hospital for the University of Chicago

Coolidge & Hodgdon, Architects

THE University of Chicago has just let the contract to build a medical building and hospital, and the work for the same has commenced. This group is located west, across the street, from the teaching campus and faces south on the Midway, and will occupy two city blocks. A rough idea may be gained of the size of these buildings when it is realized that they contain one-third as many cubic feet as all the rest of the University buildings. The buildings were designed after a study of hospitals in this country and abroad and consultation with medical educators with the idea of meeting the requirements of education and research in medicine, and providing the best facilities for the care and treatment of patients.



North entrance tower to Medical Building, University of Chicago Medical Building and Hospital.

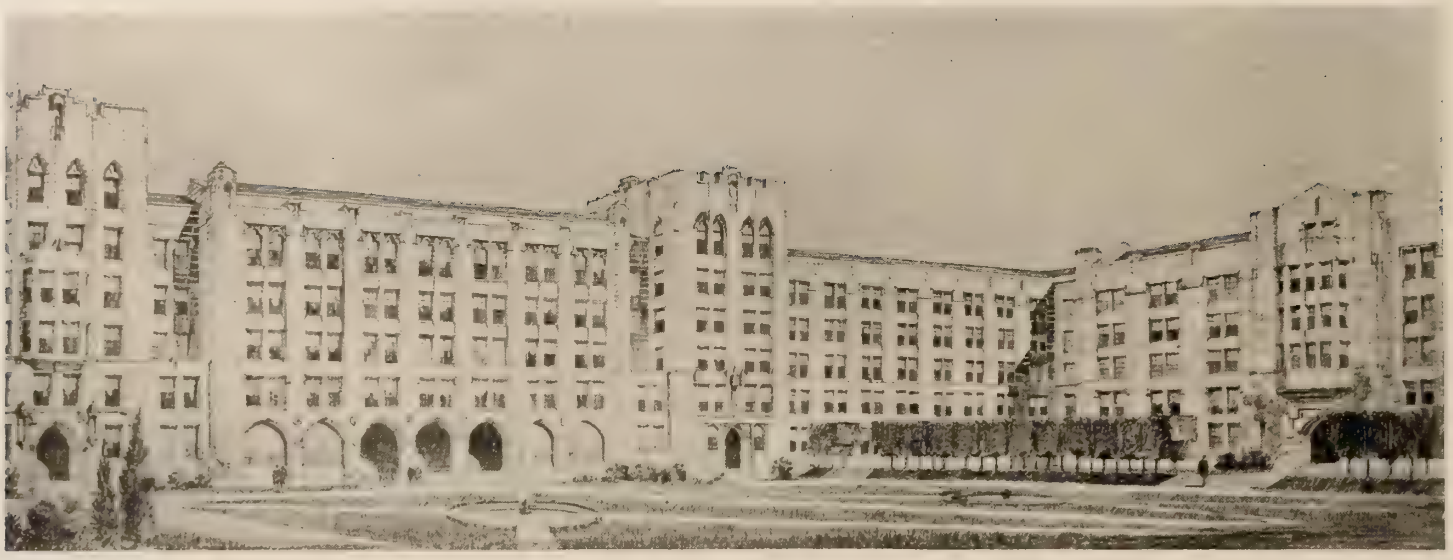
It was felt that the requirements for medical education and research might best be met by providing for the different laboratory branches and the two main divisions of clinical medicine, medicine and surgery, in separate buildings, which would be more or less complete in themselves and might be operated as units. At the same time it was felt that a physical separation was not desirable, in order to secure a correlation and co-ordination of the work of these departments, for the purposes of relationship to the public in the care and treatment of patients and for the sake of economy and efficiency in operation, to avoid duplication of services that might be used in common.

It was an essential part of the scheme that additions might be made to each of these units for expansion and for the accommodation of related subjects without any change in the arrangement of the present buildings. It is planned to erect five buildings at this time; one for physiology, pharmacology, and surgical chemistry, which at present will not be connected with the other buildings in the group; a building for the medical clinic; a building for surgical clinic; one for pathology, and one for administration and the common services. The buildings will be grouped around courts. The northern end, which is at the top of the general perspective, will be the medical school court, from which entrance will be gained to the different laboratory buildings and to the laboratory section of the medical clinic and the surgical clinic. That is, this court will be used largely by students and members of the staff who are more directly concerned in the educational features of the work.

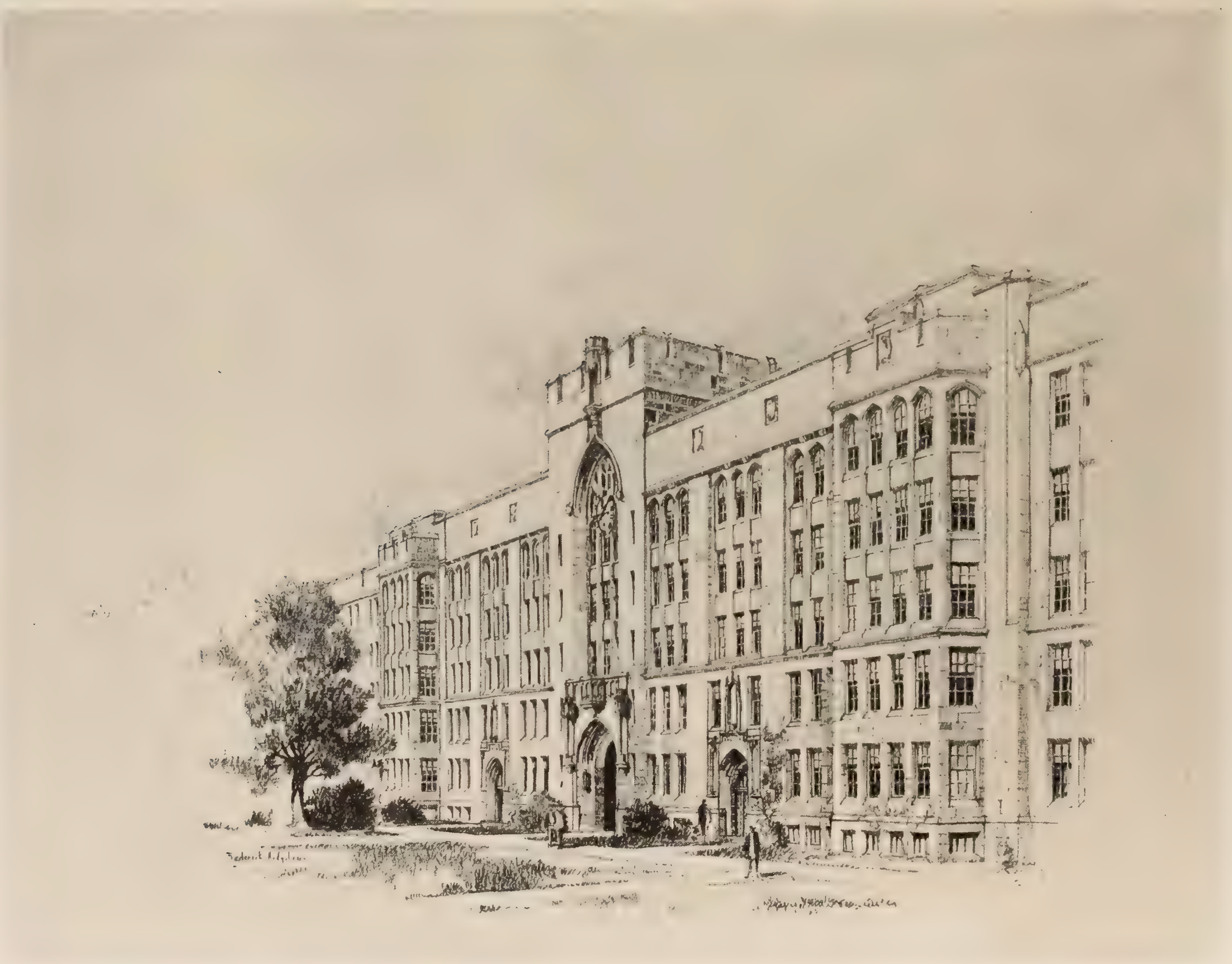
The building for pathology is placed between the northern ends of the medical building and the surgical building, which are joined toward the south by the administration building, forming a large central court. The main entrance of the administration building is at the north end of the first central court, facing the Midway. The west side of this court is occupied by the dispensary, with its entrance for dispensary patients. The ambulance entrance will be at the southwest court and the service entrance is in the middle-west court.

The material for the exterior throughout is Indiana limestone, like the material used in all of the other buildings of the University. The buildings are wall-bearing with reinforced concrete floors and columns. The ceilings throughout the laboratories will be unfurred, and the interior walls and ceilings of the medical school and laboratories will be left unplastered and will be painted directly on the brick and terra-cotta.

The heating throughout the group will be done by hot water, heated in four heaters centrally located. The water for domestic use will be heated in the basement, and the steam brought from the power-house. Refrigerator machin-



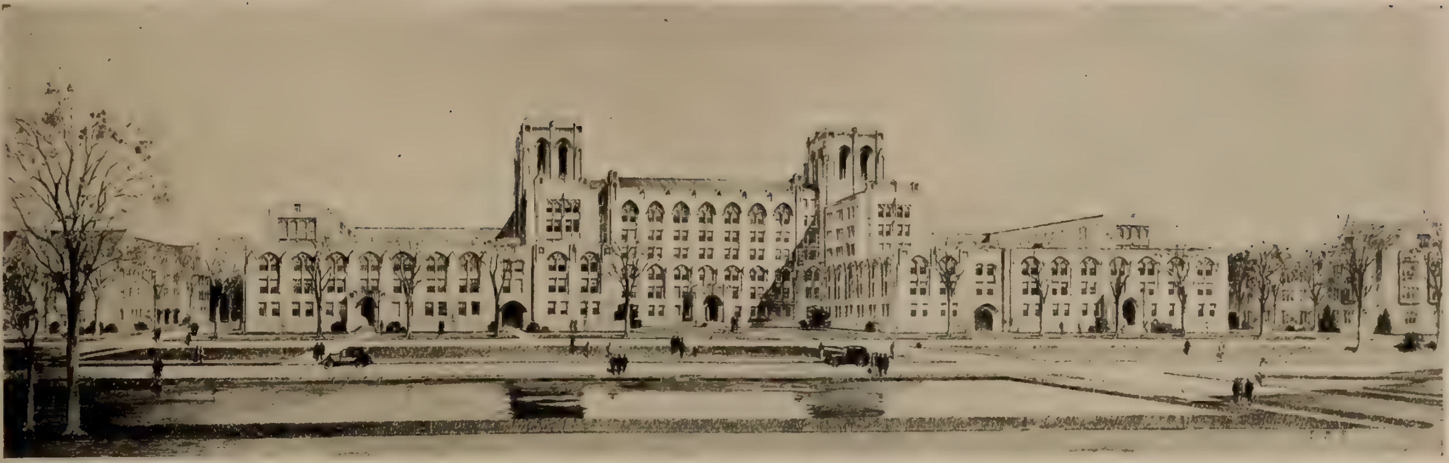
Medical School court, looking south.



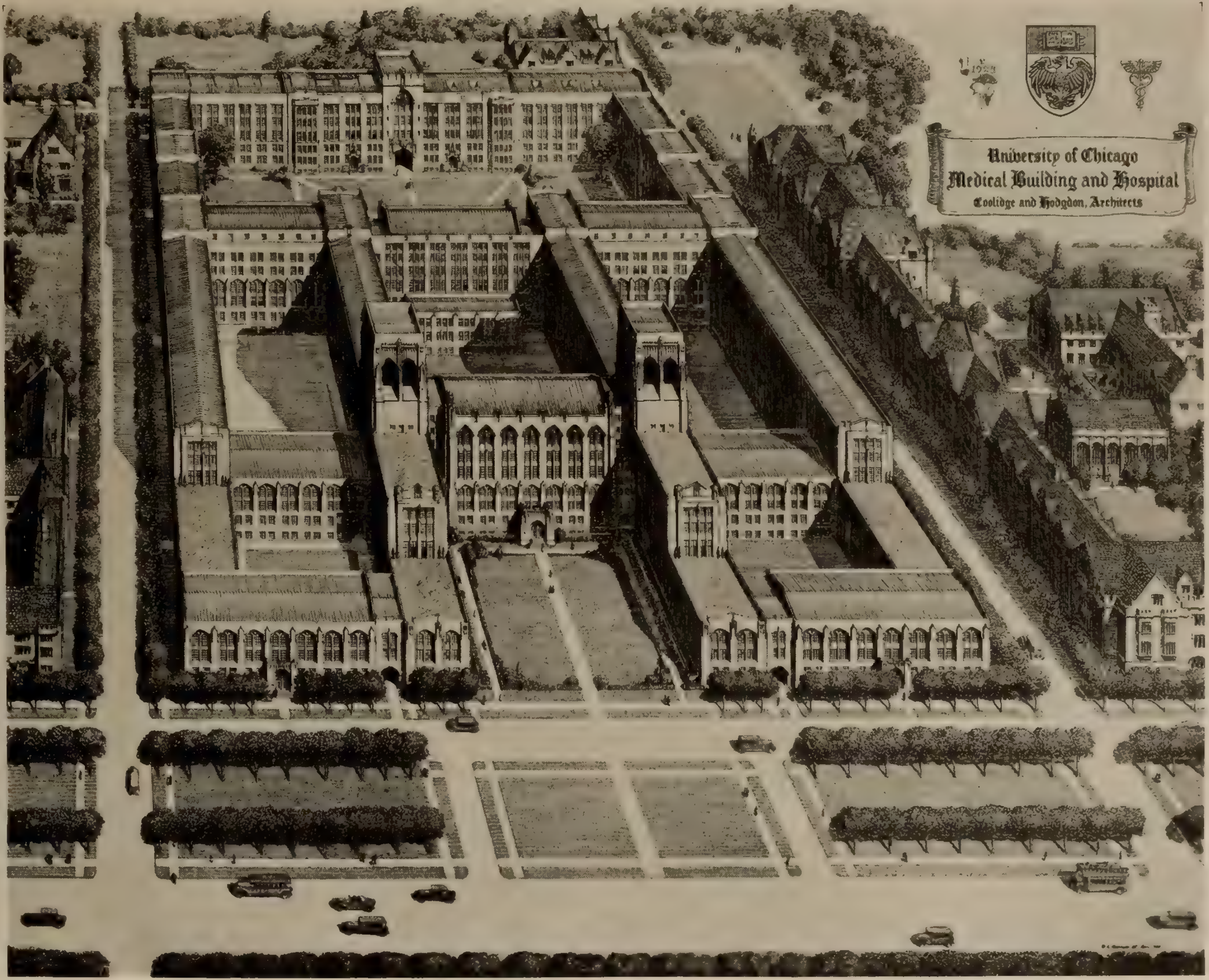
Physiology Building from Medical School court, University of Chicago Medical Building and Hospital. Coolidge and Hodgdon, Architects.

ery will be in the basement, and the brine will be piped to the various refrigerating centres. The electric service is partly furnished by the University and partly purchased. Underneath the entire building is a sub-basement, 6 feet in the clear, which is to be used for piping, ventilating ducts, and machinery equipment. The other stories above are 10 feet 10 inches in height from floor to ceiling.

The two central towers are used for elevator machinery and tanks, and are slightly higher than the towers of Harper Library on the campus one block east.



View from the midway.



University of Chicago
Medical Building and Hospital
Coolidge and Hodgdon, Architects

On the first-floor centre portion of the building is the main assembly-room, which seats 280 people. Above this, on the second floor, is the Billings Memorial Library, which is estimated to hold 8,000 volumes. This library has been given to the Medical School by Dr. Frank Billings.

Dining-rooms for nurses, staff, and petty officers, serving-rooms, the kitchen, storerooms, etc., are located in the basement. The buildings are equipped with six electric elevators, pneumatic tubes, refrigerating machinery for cooling the water and making ice; there is a doctor's call system, doctor's "in" and "out" system, and nurse's and orderly's call system.

The operating-floor is on the top floor of the centre portion facing north, and is largely planned to meet the requirements of an ordinary hospital and partly for a teaching hospital of an expected future capacity of 600 beds. The present capacity of the hospital is for 200 beds.

Country Villages Need Toning Up, Say Government Experts

NEED for improving country villages in the United States to meet modern social and economic needs, is emphasized in a nation-wide survey made by the United States Department of Agriculture.

Most villages, declare department officials, have "just grown up," with resultant defects in form and arrangement to provide social, æsthetic, and economic advantages for residents and near-by farm families. The need for well-planned villages is pointed out in the fact that some 20,000,000 people in the United States live in villages, and that more than 30,000,000 farm people use these centres for purposes of trade, education, religion, and recreation.

Numerous instances are cited by the department where villages have been literally rebuilt to meet modern requirements. The village of Weston, Mass., for example, under the direction of the town-improvement commission has in the past few years entirely reconstructed its business district to form a notable civic centre. Old public buildings and shops have been removed, a disease-breeding swamp was filled in and grassed over to form a common, a beautiful new town hall was erected, public buildings were regrouped, and convenient approaches and roadways constructed.

The unfortunate results of undirected development in cities are being keenly appreciated, it is stated, and millions of dollars are now being spent to correct these conditions in an effort to make cities more approachable, traversable, convenient, orderly, and beautiful.

A similar situation prevails with regard to villages the country over, and replanning along proper lines now will mean considerable money saved later. Villages should be easy of access, declare the department officials, and approaches should be direct, durable, and enjoyable. Physical layouts should be based on naturalness, healthfulness, and convenience; housing conditions should be sanitary, convenient, and economical; dwellings should be satisfactory to the eye and set in pleasant surroundings.

There should be clean and well-kept lawns, tree-bordered streets, and good architecture. Dump heaps and congested places should give way to open spaces, and public parks and playgrounds, lake shores, spots of natural beauty, and points of historic interest should be set apart for the use and enjoyment of all. Public buildings should be located and arranged so as to facilitate business efficiency and stimulate civic pride.

The department has analyzed a number of instances where villages have been improved, and incorporated them in a new bulletin for free distribution. The bulletin deals with practically all phases of village improvement, and tells how individual villages have solved this problem. Copies of Farmers' Bulletin No. 1441 entitled "Rural Planning the Village," may be obtained upon request to the Department of Agriculture, Washington, D. C.

Book Reviews

SCHOOLHOUSES AND THEIR EQUIPMENT. With Plans and Illustrations of the Newest Schoolhouse Architecture. New York State Edition. By W. W. La Chance. White & La Chance, Architects, 426 Third Street, Niagara Falls, N. Y.

This book, based on many plans that have stood the test of repeated use, should be of especial value. It is a practical book dealing with matters of vital interest to every community, and is based on wide experience in this special field. The schoolhouses shown are nearly all of comparatively small size and moderate cost.

THE HOUSE THAT LOVE BUILT. By W. Francklyn Paris, M.A., L.D.H. The Hadden Press, New York.

"The House that Love Built" is a book of essays on the applicability of Italian Renaissance to modern public buildings, with Cass Gilbert's beautiful Detroit Public Library serving as an example. Mr. Paris is a decorator of established reputation whose work adorns the interiors of some of the most important public buildings in the United States. In association with Frederick J. Wiley he has contributed to the decoration of the Missouri State Capitol, the West Virginia State Capitol, and to the library building chosen as the theme of the present volume.

Mr. Paris is already known as the author of "Decorative Elements in Architecture," a book recommended by the United States Bureau of Education for its reading course on "How to Know Architecture." In the present volume he analyses the qualities that make the Detroit Library the rare flower of architecture that it is. The entire edifice is studied, but particular stress is laid on the ornamentation. There are chapters on Painted Glass, Mosaic, and Ceilings that are especially complete and profusely illustrated.

EVERYMAN'S HOUSE. By Caroline Bartlett Crane. With a foreword by Herbert Hoover. Illustrated. Doubleday, Page & Co.

"This book is written to the thousands of people who long to build a home of their own but fear they cannot afford to. Also it is written to those who cannot make up their minds as to what kind of a house they want." It was "built about a mother and her baby." So you see it is a book full of sentiment, one of those books that appeal especially to the reader of the popular home periodicals. It is the human side of home making that is paramount. Mrs. Crane was the winner of the first prize in the Kalamazoo, Michigan, Better Homes Demonstration in 1924. Gilbert Worden was the architect; Mrs. Crane the designer. It is an attractive little house, well planned. The floor plans and elevations are shown.

MASTERPIECES OF SPANISH ARCHITECTURE. ROMANESQUE AND ALLIED STYLES. One hundred plates. With Text by John Vredenburgh Van Pelt. Pencil Points Press.

This book is made up of one hundred plate pages containing hundreds of details, sections, and elevations showing examples of Spanish architecture in the Romanesque and the closely related styles which we usually class under the general term of Romanesque.

The plates are excerpts from the ponderous work published by the Spanish Government for the purpose of making a record of all the fine old examples of architecture in Spain, and issued under the title "Monumentos Arquitectónicos de España." Of the original work seven large volumes of beautifully engraved plates were issued; then the work was discontinued and these volumes are practically unobtainable. The reproduction of these fine hand engravings in the present work was a tour de force in photo-engraving. While the plates showing general views of the buildings have been reduced in reproducing them, a large number of details have been shown at the full size of the original drawings, making it possible to study them satisfactorily. There is an excellent introduction by John V. Van Pelt, in which he refers to the use of the Romanesque of Richardson, and to the splendid Bowery Bank Building by York & Sawyer.

The many decorative details shown should make the book of value to the designer as well as to the architect.

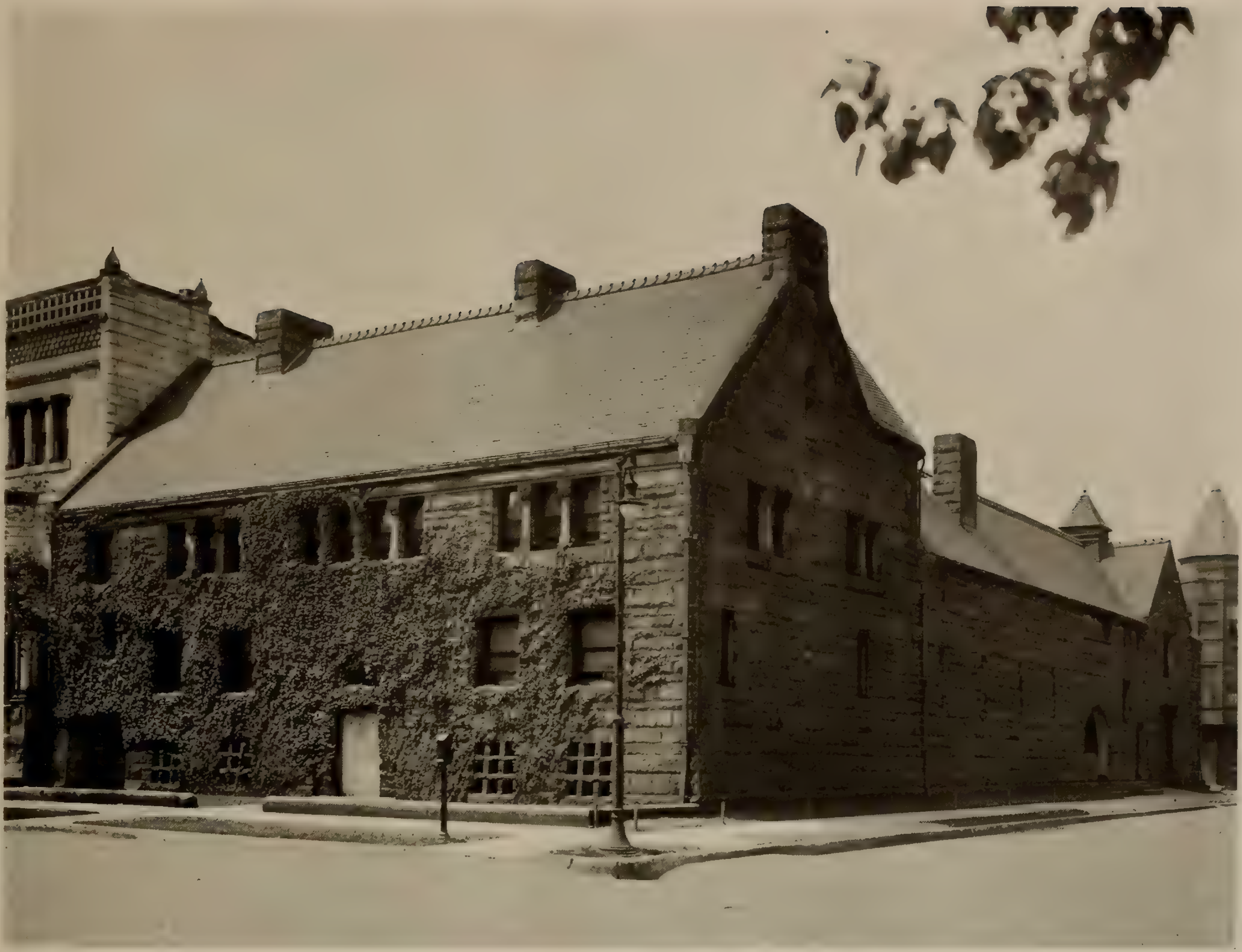
HOUSES AND GARDENS. Second Book of Houses Which Contains Over Five Hundred Illustrations of the Exteriors, Decoration, and Landscaping of Four Ideal Smaller Houses, Forty-eight Pages Showing How a House is Built, and a Portfolio of Over Sixty Small and Large Houses with Plans, Summer Camps, and Garages. Edited by Richardson Wright, Editor of *House and Garden*. The Condé Nast Publications, Inc., New York.

The houses shown in this collection are admirably selected, and the pictures of various details are all worth having. It is a book for the architect and a good book for the layman looking for just the kind of house he wants. The many illustrations make it a pictorial reference library on about everything concerning the house beautiful and comfortable.

TWENTY LITHOGRAPHS OF OLD PARIS. By Samuel Chamberlain. Limited to 100 signed copies. Printed in Paris on a fine French hand-made paper. Size 13 x 20. With a natural linen cover. William Helburn, 418 Madison Avenue, New York.

Mr. Chamberlain's drawings are familiar to all readers of Architecture, and the fact that he has turned some of his time to the fascinating mediums of lithography and etching will be no surprise to his admirers. He knows his Paris, evidently, and has chosen his subjects with excellent judgment. Few mediums offer more opportunity to the sympathetic draftsman than the lithographic crayon, and Mr. Chamberlain shows in these beautiful prints that he loves his work and finds therein an especial appeal to his sense of the picturesque. He knows how to make the rich, velvety blocks count and, as in his etchings, he has learned the art of wise omissions and the value of suggestion.

These prints should appeal with special emphasis to the collector.



The John J. Glessner house, home of the Architects' Club of Chicago. H. H. Richardson, Architect.

The Architects' Club of Chicago

PLANS for the securing of a suitable home for the club were the result of a dinner chat. During the discussion it was suggested that the well-known John J. Glessner house, located at the southwest corner of 18th and Prairie Avenues, would be an ideal building to house the architectural profession in Chicago. The house has long been recognized by the profession as an outstanding example of H. H. Richardson's genius.

President Fox, of the Illinois Society of Architects, offered to President Granger, of the Chicago Chapter, a solution of the problem by suggesting that the architects ask Mr. Glessner to provide in his will that the architects should have the first opportunity to purchase his house.

Mr. Glessner was genuinely pleased that the A. I. A. should want to preserve his house and told Mr. Granger that he would discuss it with his family, etc., with the outcome that he shortly afterwards advised President Granger that he was prepared to give his home to the Chicago Chapter, A. I. A.; the property to go to the chapter at his death or prior to his death should he give up using it as a residence.

Mr. Glessner, however, made one of the conditions of his gift that until his death or during the time when he should continue to occupy his own home the architects must secure and occupy as their headquarters the Kimball house, located directly across Prairie Avenue from his home.

The securing and occupancy of the Kimball house, which was made mandatory by the Glessner legacy, appeared to be too great an undertaking for the Chicago Chapter, A. I. A., to undertake alone, and the Illinois Society of Architects was invited by the chapter to co-operate in the undertaking.

Committees were appointed to represent the two organizations and were given power to act; the Chicago Chapter, A. I. A., being represented by President Alfred Granger, George C. Nimmons, and Richard E. Schmidt; the Illinois Society of Architects by President Charles E. Fox, F. E. Davidson, and J. C. Llewellyn.

The joint committee examined in detail both properties under consideration, and after several meetings and the most mature consideration, developed a plan whereby it was possible to secure by purchase the Kimball property, and thus make it possible for the architects of Chicago to secure by gift the wonderful treasure, the Glessner home.

The only feasible plan suggested was the formation of a club to own and occupy the Kimball residence. The general plan of organization of the club as suggested by President Fox and approved by the joint committee was referred to the two architectural organizations and was approved, and the committee instructed to proceed with the organization of the club.

The Kimball house. S. S. Beman, Architect.

At this time it was suggested that the club which has for years been known as the Chicago Architectural Club be taken into the organization, and upon the invitation of both the chapter and the society the Chicago Architectural Club joined in the movement.

It was also agreed, by the terms of a contract approved by the three organizations and signed by their executive officers, that the Illinois Society of Architects and the Chicago Architectural Club shall share with the Chicago Chapter, A. I. A., in all of the privileges and benefits to be derived from the Glessner gift; the other societies sharing with the chapter in the maintenance and operation of the building. The title of the Glessner home, however, will be vested in the Chicago Chapter, A. I. A., which was one of the conditions of the Glessner gift.

The plan of organization as adopted provided for four classes of membership:

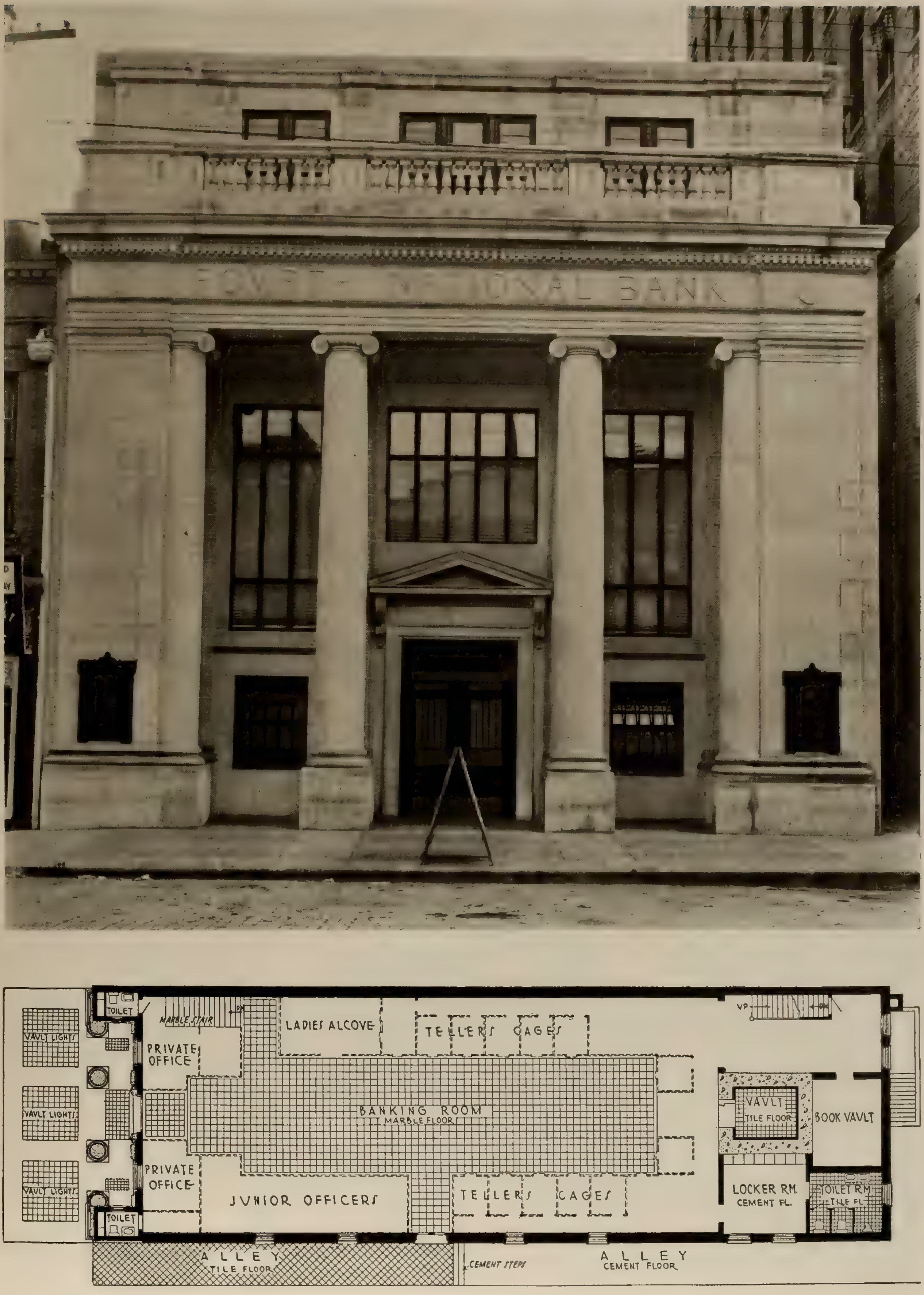
First: Proprietary members.
Second: Regular members.
Third: Non-resident members.
Fourth: Honorary members.

The proprietary members to be limited to 100 in number and each proprietary member to subscribe $1,000 and to receive 7 per cent interest on the funds so subscribed; the proceeds of the sale of proprietary memberships to be used for the purchase of the property and the making of necessary repairs to the building to adapt it to club purposes.

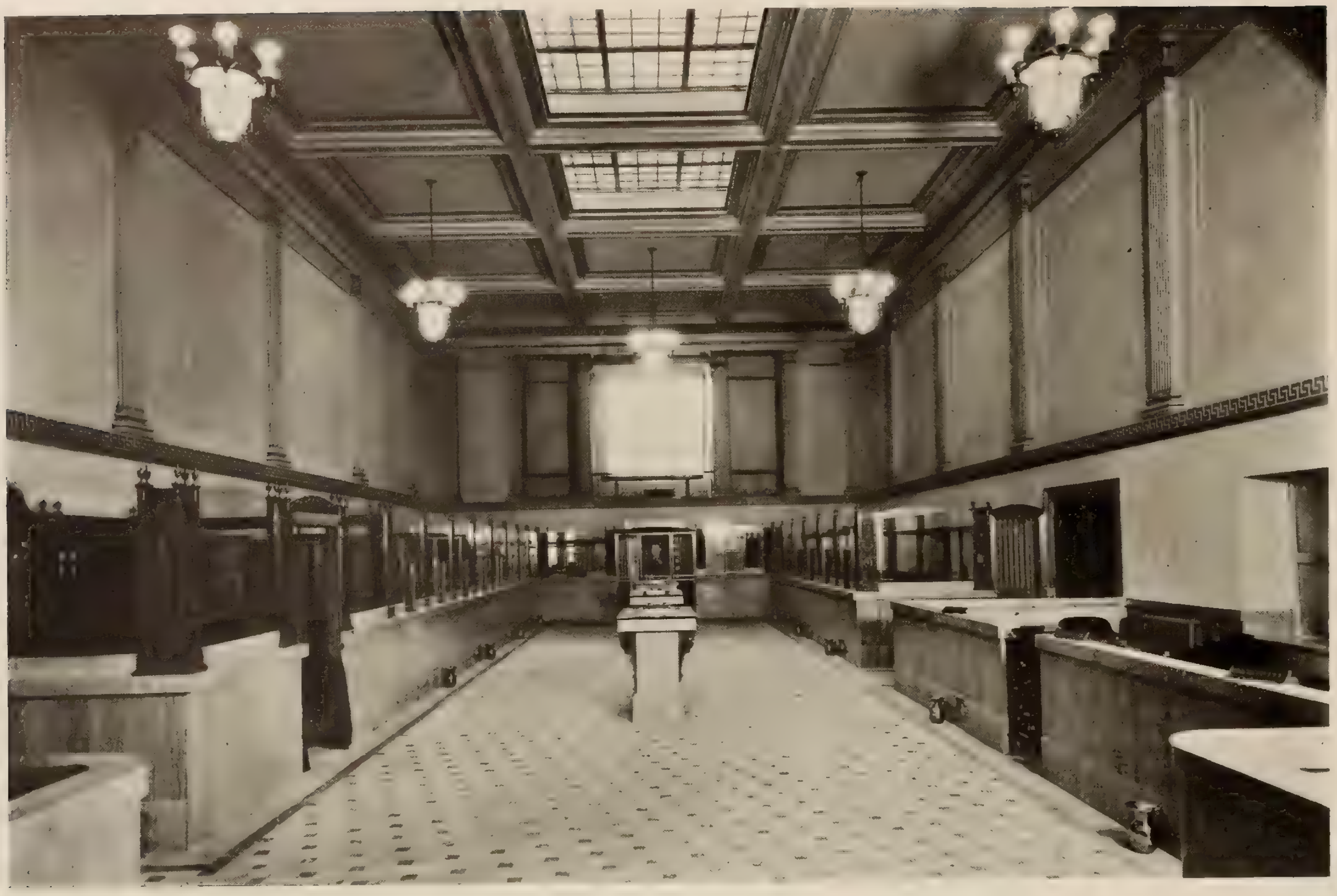
The proprietary members are to pay no initiation fee, but are to pay the regular yearly dues that regular members pay. Regular members are to pay an initiation fee of $100 each and yearly dues of $50.

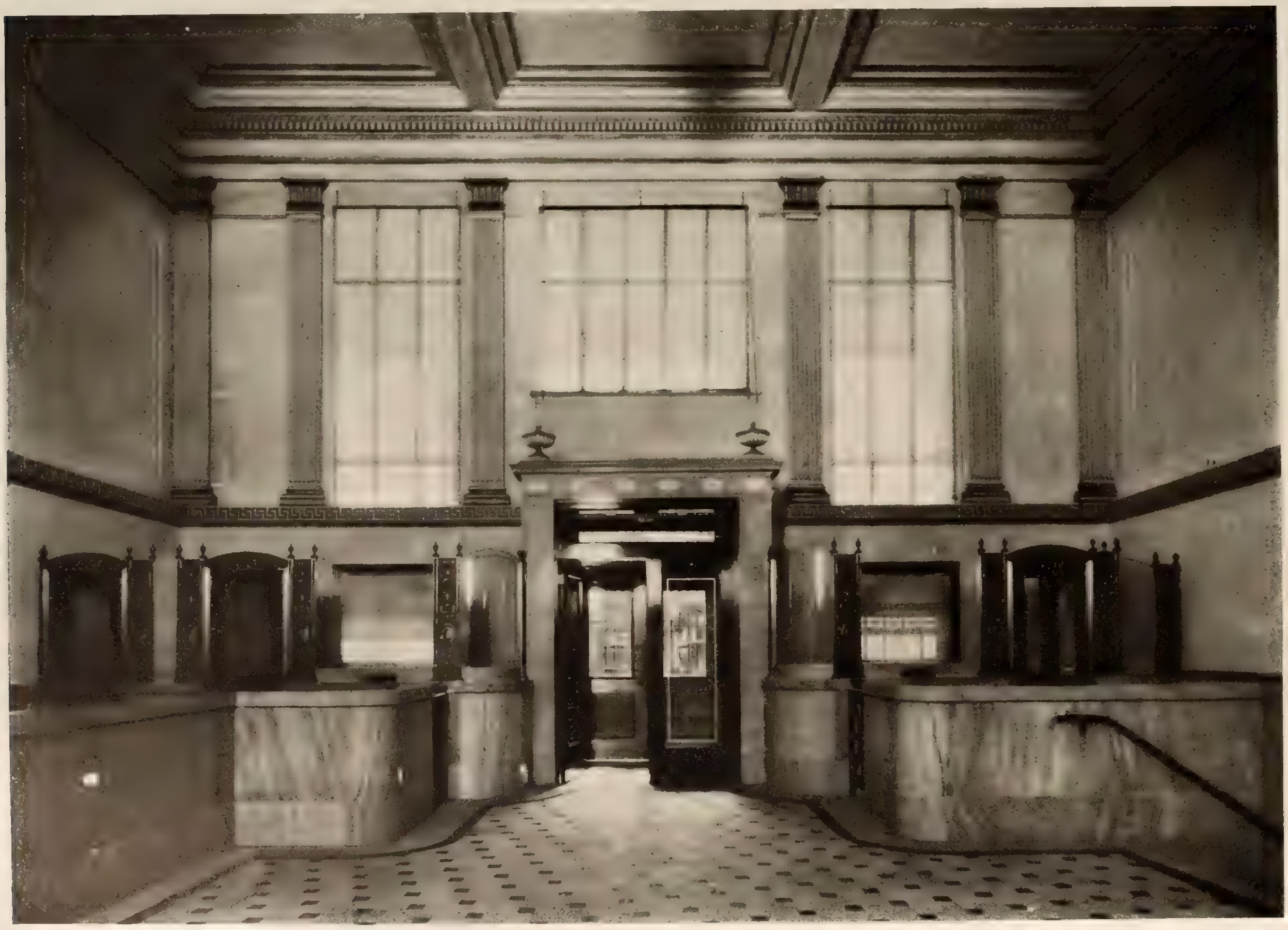
It might be noted at this point that the plan of organization as adopted by the three organizations provided that every member in good standing in either of the three organizations was by that fact eligible for membership in the new club, and that the professional members of the club shall be members of either one of the three professional organizations and that ceasing to be a member of one of the three organizations shall operate as a resignation from the club. In this way it is hoped to strengthen the three parent organizations and to make membership in the club more desirable.

It was suggested that the club could be greatly strengthened by admitting to membership the leading representatives of the various contracting organizations, the representatives of the material interests, leading bankers, representatives of the metropolitan press and others who are connected either directly or indirectly with the building industry, and the drive committee invited some twenty of the leading representatives of the various contracting and building material organizations to a luncheon, at which time the plan was discussed and was approved by every representative of the contracting and material interests attending the luncheon.



FOURTH NATIONAL BANK, MONTGOMERY, ALA. Okel & Cooper, Architects.





BANKING ROOM. Okel & Cooper, Architects.

FOURTH NATIONAL BANK, MONTGOMERY, ALA.

The Romance of Building

By Richard P. Wallis

SECOND ARTICLE

THE problem of obtaining a suitable cementatiousagent to bond together these blocks of masonry, or, as the Irishman sagely remarked, "to keep thim apart," was not so readily solved, and the cautious experiments of our early masons in compounding a suitable medium for this purpose afford an interesting commentary on man's slow but successful endeavor to wrest from nature that knowledge that alone makes possible all human advancement. Man has long been aware of the peculiar adhesive property of calcareous materials. This knowledge extends back probably to a period beginning some five centuries before the dawn of the Christian era. The pyramid-builders of the Egyptians utilized a gypsum binder made by lightly burning the crude gypsum rock of which the pyramids are composed. This cement proved entirely adequate in a mild and equable climate such as that of ancient Egypt, but in localities of more rigorous temperatures would be of but little value.

The Romans in the execution of their building projects utilized a powdered lime to which was added a silicious material of volcanic origin taken from Pozzuoli, at the foot of Vesuvius. To this binder, as a consequence, was given the name of Puzzolanic cement. To-day blast-furnace slag is substituted for the volcanic ash of the Romans in the preparation of the modern replica of this particular variety of cement. The hydraulic properties of this early cement made possible the great aqueducts—the scattered ruins of which to-day delineate the limits of the ancient Roman Empire. The works of Pliny and Vitruvius abound with references to the use of this material in the execution of the private and public works of the time.

Upon the decline of the Roman Empire this cement fell into disuse, and in time the secrets of its manufacture became lost. During the dark days of the Middle Ages little advance was made in the manufacture and use of cementing material. It was not until 1756 that the efforts of John Smeaton, in seeking a suitable binder for use in connection with the rebuilding of the Eddystone Lighthouse, reawakened an interest in the problem of securing a better cementatious medium. From then on an intelligent attempt was made to master the problem, and the names of Parker, Dobbs, Pasley, Vicat, Frost, Smeaton, and Aspdin stand out as mile-posts in the development of this art.

These earlier cements were what is technically known as natural cement and were produced by burning, at a low temperature, certain impure limestone—the impurities consisting of clays in varying proportions. The resulting product, when mixed with water, produced a cementing material better than anything hitherto produced. Its obvious defects were lack of uniformity, due to the crude methods employed in its manufacture and the natural variation in proportion of clay and lime existing in different deposits of cement rock.

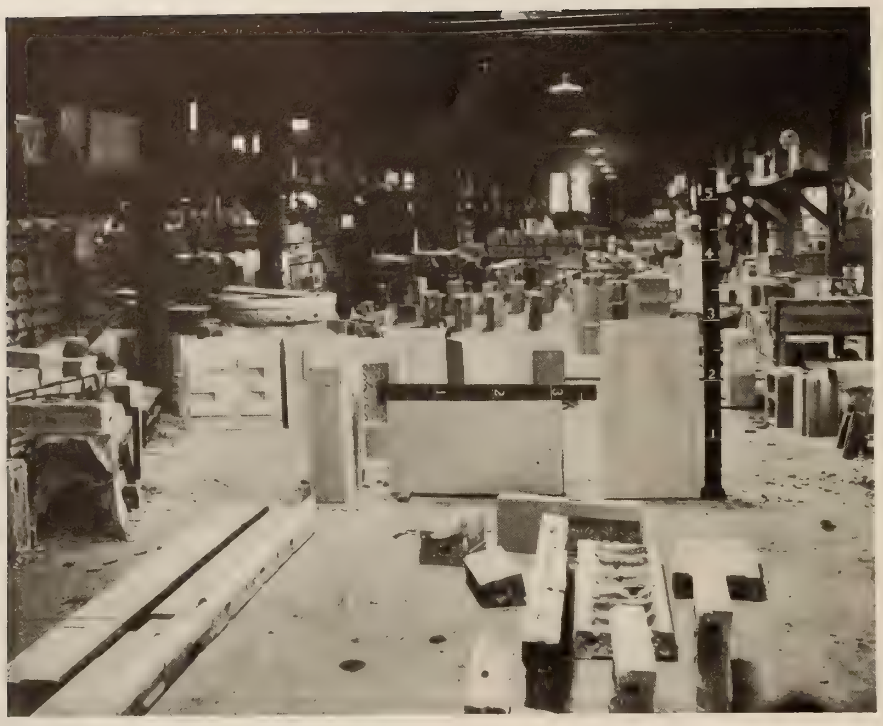
The Portland cement of to-day is but the logical development of these early experiments. A scientifically proportioned mixture of clay and lime burned to the point of incipient fusion produces a hard clinker which when ground to a nearly impalpable powder represents the Portland cement in such common use at the present time.

It was at Leeds, England, in May, 1824—a hundred years ago—that the bricklayer Aspdin, after various experiments in burning lime dust taken from the highways, found that the clinker, hitherto discarded, resulting from subjecting the raw ingredients to a higher temperature than was up to that time considered good practice contained when ground and mixed with water certain properties that produced a cement harder and more durable than any of the natural cements then in use.

This new material was christened "Portland Cement," owing to a fancied resemblance in color it bore to the building stone, then much in favor, quarried on the Isle of Portland, off the southern coast of England.

It was not, however, until well into the second quarter

A typical brick plant.



Typical scene in terra-cotta shop.

of the nineteenth century that the practice of burning this mixture to the point of incipient fusion, one of the distinguishing features of a true Portland cement as differentiated from a natural cement, became definitely established.

In America the first cement produced was in 1818, for use in the Erie Canal. This was a natural cement obtained from a rock found near Chittenango, New York. As the advantages of cement became better appreciated, suitable rock deposits of more or less varying compositions became available in widely scattered portions of the country. The peak of production of natural cement was reached in 1899, when 9,868,119 barrels were manufactured.

Portland cement was not manufactured in this country until the early seventies. As its advantages over natural cement became better understood its manufacture and use rapidly increased at the expense of the former. The year 1923 witnessed a production of 137,000,000 barrels of Portland cement, or the equivalent of a daily production of 375,000 barrels—an output greater than the production for the entire year of 1890.

The early methods of production were comparatively simple in their nature. The natural cement-rock was broken into small bits and placed in upright kilns of limited capacity, alternating with the layers of wood and coal used as fuel. After firing, the clinkers were withdrawn from the bottom of the kiln and ground between burr-stones operated sometimes by water-power and sometimes by windmills. The more or less finely pulverized product of these burr-stones was in turn successively screened until the desired degree of fineness was obtained.

These early natural cements were, as one might expect, extremely unreliable, owing to the variations in the composition of the natural cement-rock and to the crude and unscientific methods employed in their manufacture.

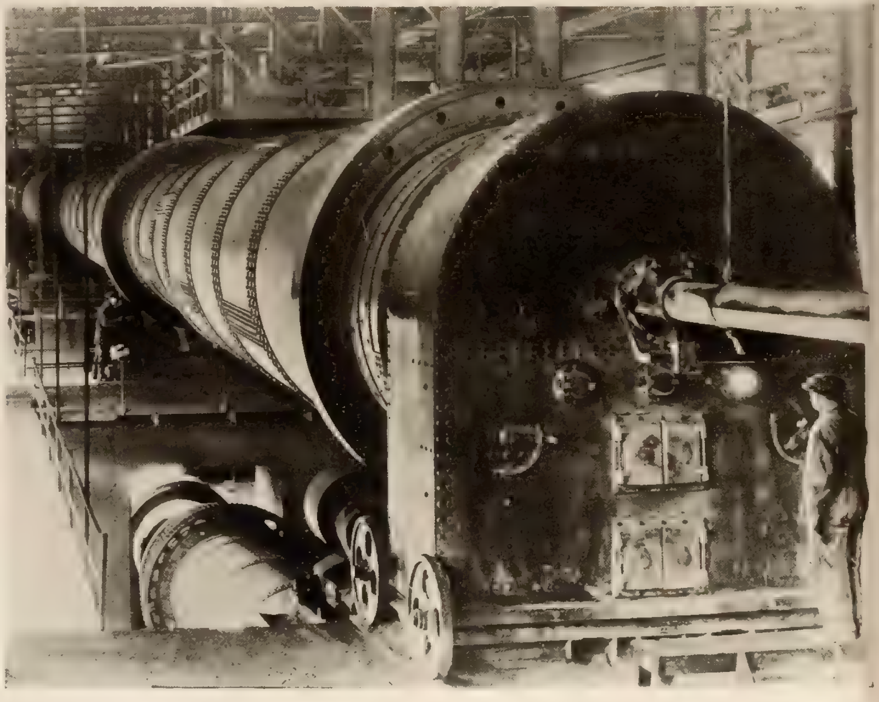
The manufacturing processes of the present day are in principle essentially those of our forefathers. In order, however, to meet the demands of the building public for a standard article it has become necessary to introduce a definite scientific proportioning of the raw ingredients and a substitution of modern equipment for the obsolete machinery of a generation or so ago.

Fortunately the necessary raw ingredients—calcareous matter, such as limestone, marl, chalk, and alkali waste, and argillaceous matter, such as clay, slate, shale, and blast-furnace slag—are accessible in practically unlimited quantities throughout the length and breadth of the country.

The process of converting this earthy matter into utilitarian form commences with the quarrying of the raw materials as found in natural deposits. Great ledges of limestone are blasted into bits and the fragments reduced by the nut-cracker action of the huge gyratory crushers to a size averaging six inches or less in diameter. This coarsely pulverized product is still further reduced in fineness by subjecting it to the impact of rapidly revolving beaters contained in the so-called hammer mill. The granulated rock is then stored in large bins. During this time steam-shovels have been busily engaged in building up stocks of argillaceous matter from the neighboring clay banks.

In case the so-called "dry process" is to be followed in the manufacture of the cement the materials are passed through huge rotary dryers to remove as much as possible of the contained moisture. In case the "wet process" is adopted, water is added to the crushed rock during the process of grinding to form a slurry; otherwise the two methods are practically identical.

From the dryers the rock is conveyed to the blending-bins, the contents of which are sampled and recorded hourly



Cement clinker being formed inside this modern rotary kiln at a temperature of from 2,500 to 3,000 degrees Fahrenheit.

A modern Portland cement plant. The manufacture of cement in a plant like this is a continuous process.

so that a proper mixture of limestone and clay may be effected.

The fine grinding of the raw material is accomplished generally in two stages: first, in a ball mill, consisting of a short cylinder filled with steel balls, and then in a tube mill, a longer cylinder carrying fifty tons or more of steel balls, flint pebbles, or other grinding medium.

From the raw mix storage the proper proportions of lime and clay are fed to the kilns. These rotary kilns are generally 10 feet or more in diameter and range in length from 100 feet to 200 feet or even more. These rotating cylinders are lined with fire brick and are slightly tilted, so that the charge of raw materials works its way through under the impetus of gravity. An intense heat, maintained at a temperature of from 2500° to 3000° F., at the discharge end is produced in the kiln by burning finely pulverized coal injected under air pressure. This great heat promotes a chemical combination of the lime and clay particles, resulting in the formation of greenish-black Portland cement clinker.

After cooling, a small amount of gypsum is added to the clinker to insure a setting time limit compatible with field requirements.

The grinding of the clinker, like that of the raw materials, is accomplished in two stages—first in a centrifugal mill and later in a tube mill, similar to that above described.

This final grinding reduces the clinker to a fineness such that at least 78 per cent of the product will pass through a sieve having 40,000 meshes to the square inch.

This process of manufacture has been aptly described as that of passing a mountain through a silk handkerchief. With this accomplishment already achieved, can one longer doubt the ability of man to set at naught the ancient Biblical injunction of passing a camel through the eye of a needle!

The finely ground Portland cement is then automatically weighed and packed in cloth and paper sacks ready for shipment to the distributors.

It is estimated that during the year 1923 the cement plants of the United States used over 15,000,000 pounds of dynamite in blasting out the 33,000,000 tons of rock utilized in the process of cement manufacture. Over 10,500,000 tons of coal, 4,700,000 pounds of fuel oil, and 4,000,000,000 cubic feet of gas were consumed during this period in the various cement plants. Replacements amounting to 320 miles of belting and 4,500,000 fire brick are necessary to compensate for the normal wear and tear on plant equipment over a period of a year. Sufficient grease to lubricate 93,000 taxicabs and enough lubricating oil to keep 46,000 additional cabs in running order for a period of a year are required annually to keep in suitable working order the machinery incidental to the manufacture of cement.

There are to-day over 225,000,000 cloth sacks in use, of which 60,000,000 are lost or destroyed annually. To make good this loss necessitates a strip of cloth 34,000 miles long and 30 inches in width, requiring some 25,000,000 pounds of cotton for that purpose. Over 46,000 miles of wire alone are required yearly to tie the sacks that contain this magic cementatious agent.

These figures dazzle the imagination with their very vastness, but when one considers that in the year 1923 the consumption of Portland cement in the United States alone amounted to approximately 450,000 barrels per working day, or 45,000 barrels per working hour, 750 barrels per working minute, or 12 barrels per working second, it becomes evident that these figures but reflect the tremendous growth of this lusty infant industry.

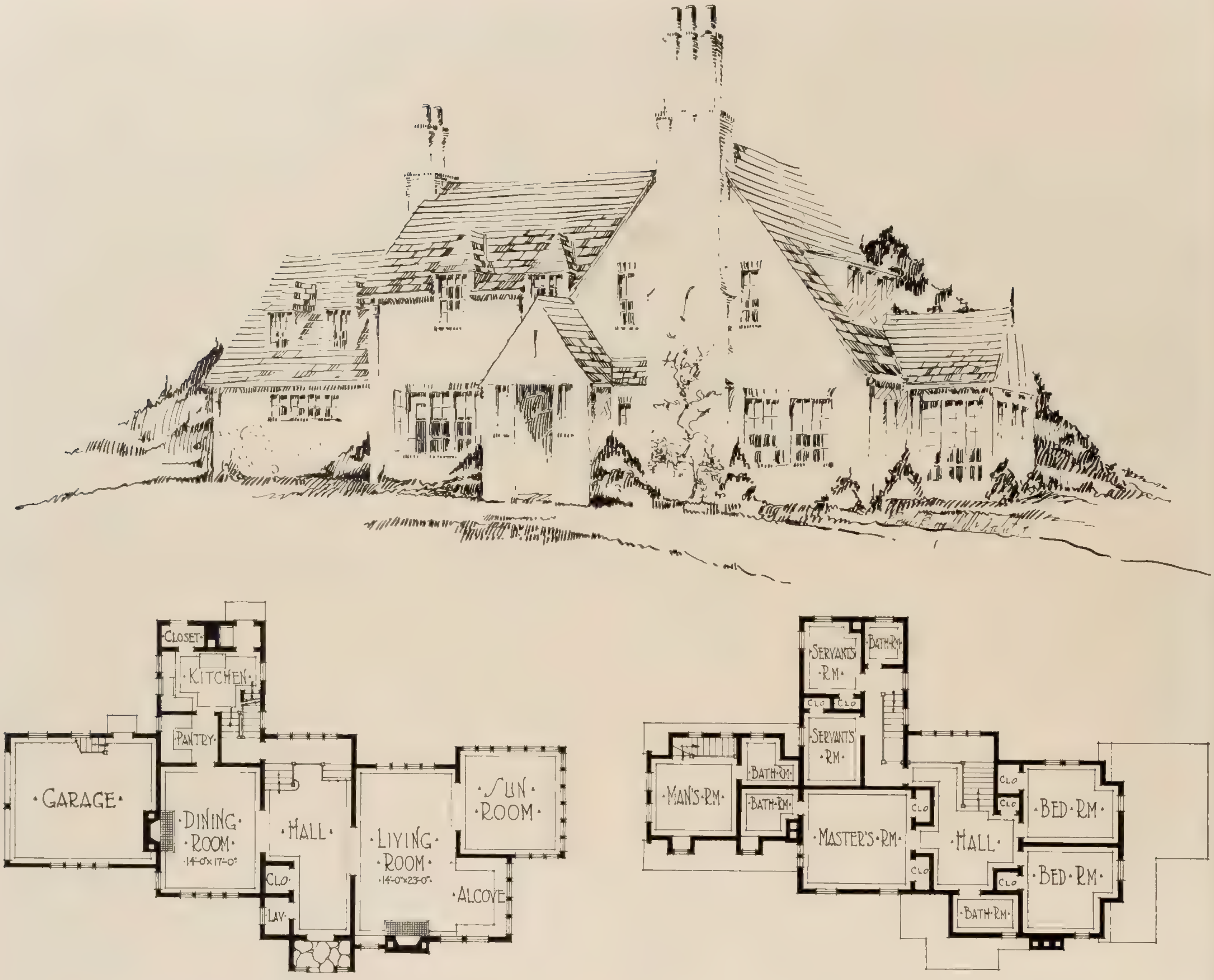
The quantity production of a reliable cement has revolutionized the building industry. Portland cement when combined with fine aggregate, such as sand, produces an incomparable mortar for brick, stone, and terra cotta masonry. Combined with sand and coarser aggregate, such as crushed rock or crushed slag, a synthetic building stone is produced, limited in size only by the whims and fancies of the engineer or architect. The addition of steel reinforcement permits of subjecting this artificial stone to tensile stresses and makes possible the great structural members of concrete so universally employed by the structural engineer of to-day in the solution of his problems.

We live in a new stone age, where plastic stone, composed of cement and aggregates, is moulded into forms to suit our convenience. We have concrete buildings, bridges, retaining-walls, tanks, freight-cars, fence posts, walks, drives, silos, harbor works, canals, dams, statuary, and so on. Its possibilities are limitless, and as our engineers press onward in their quest for knowledge we may confidently look forward to a time when fire-proof concrete will replace combustible wood in the construction of those edifices essential to us in our daily walks of life.

Medusa Portland Cement, manufactured near Sandusky, of material found in the great limestone deposits of that district, was used exclusively in connection with the mortar and concrete entering into the construction of the Cleveland Library.

A special cement known as "Saylor's Reground," having a fineness such that from 95 to 97 per cent will pass the standard 200-mesh sieve, was used for setting the sidewalk light over the first floor workrooms. This fine-ground cement (standard cement passes only 78 per cent through the 200-mesh sieve) makes possible a water-proof homeogeneous concrete mass, highly essential in good sidewalk light construction, but uneconomical for general use in building construction.

This special cement is manufactured at Coplay, Pa., the birthplace of the Portland cement industry in America, in the great Lehigh cement district, and takes its name from David O. Saylor, the father of the Portland cement industry in this country.



· FIRST · FLOOR · PLAN ·

·SECOND · FLOOR · PLAN ·

SKETCH FOR RESIDENCE.

Royal Barry Wills, Architect.

Hollow Tile Walls Given Fire Test

Double Shell Tile Makes Good; Plaster Also Proves Aid to Fire Protection in Bureau of Standards Tests

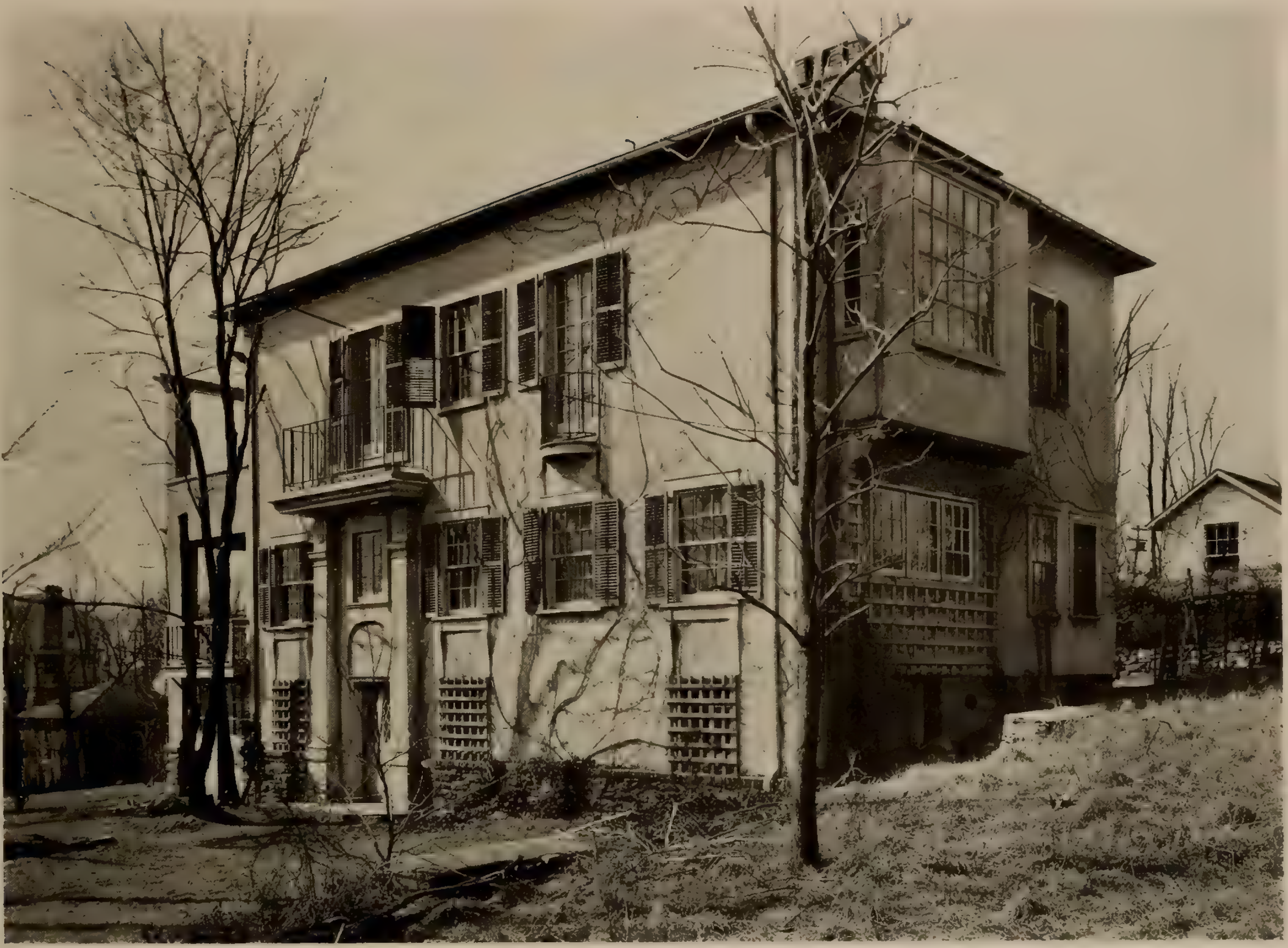
HOLLOW building tile having double shells on the two exposed sides give very good results from the point of view of fire protection, the Bureau of Standards finds. The exposed shell serves as a protection for the rest of the tile, and in order to distribute the stresses properly, the webs connecting this outer shell with the inner wall of the tile should be thinner, or less in number, than the webs back of the inner wall.

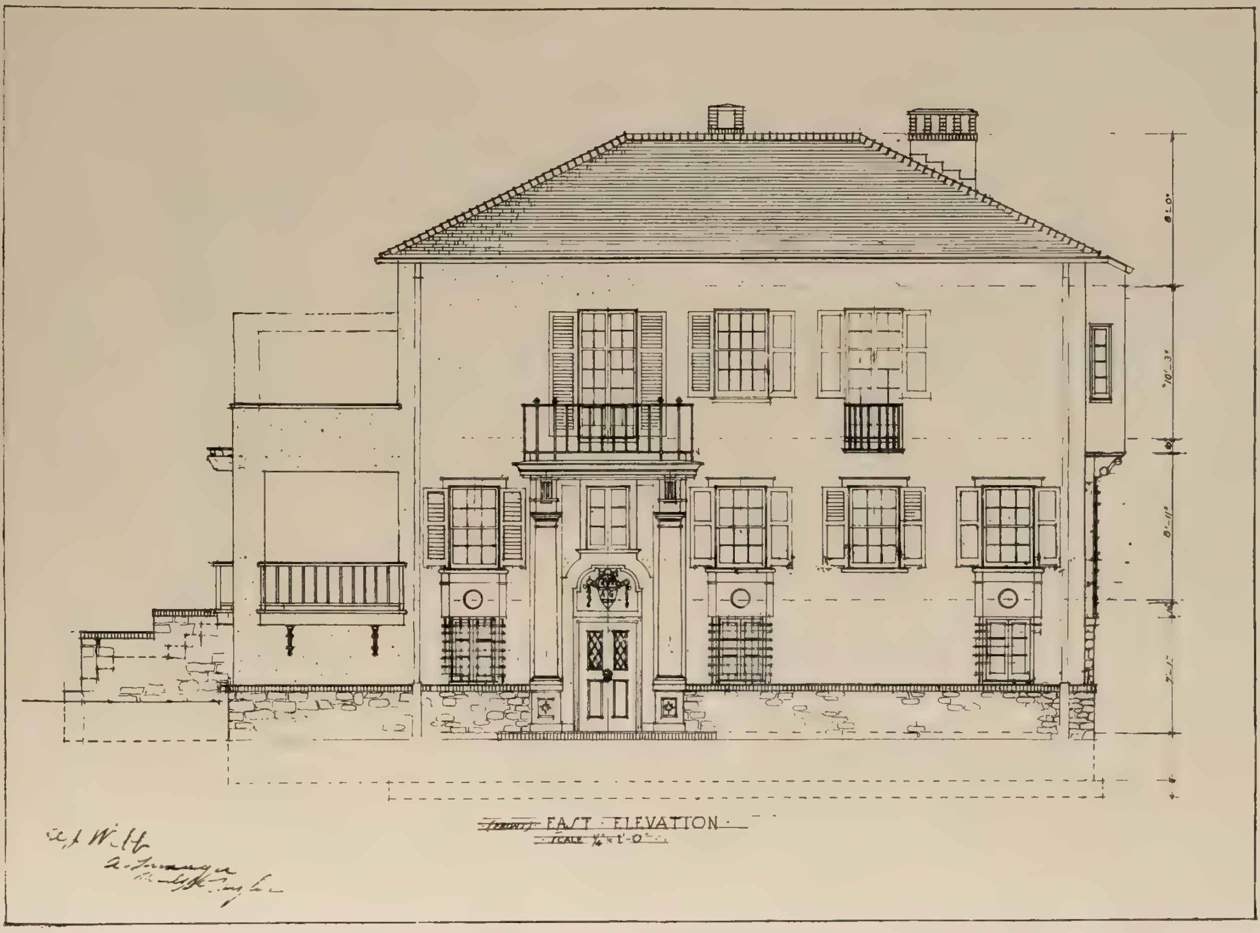
Gypsum and Portland cement plaster coatings over hollow tile will stay in place during ordinary fire exposure, and will give about the same protection from fire as the addition of one wall and cell to the thickness of the tile.

The addition of a combustible filler, such as sawdust, to the clay in amounts from 5 to 15 per cent by volume, decreases the cracking of the burnt tile when exposed to fire, but has the disadvantage of producing a decrease in strength for the larger amounts of filler, thus lessening the ability of the tile to carry load under fire exposure.

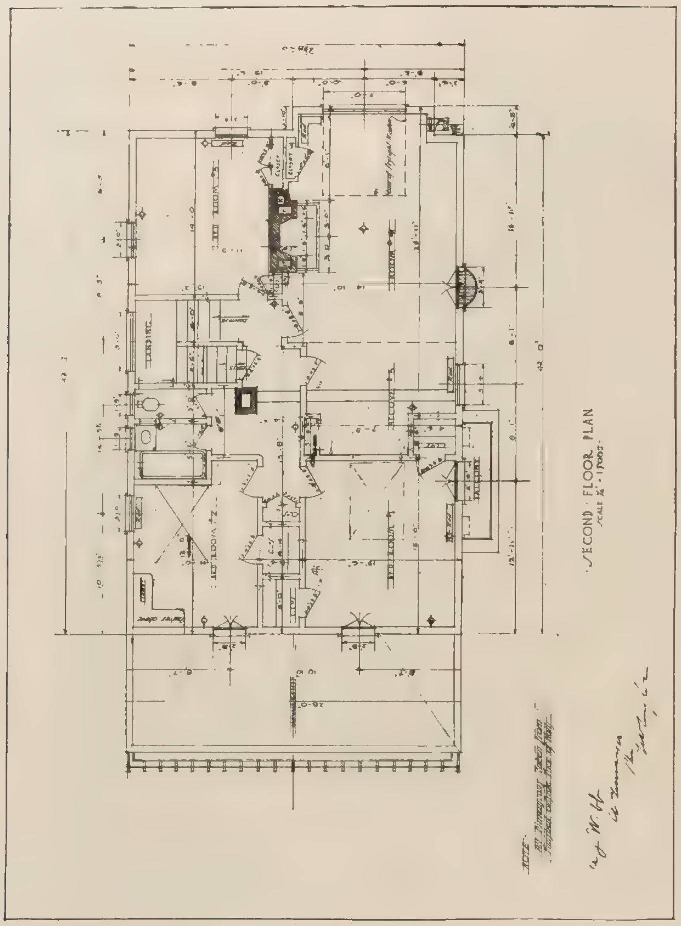
More than one hundred tests of small tile panels have been made, the panels forming one side of a special furnace. Eight tests have been made on walls eleven by sixteen feet, and these are the first of a series of fifty fire tests to be conducted on hollow tile walls in the near future. Some of these walls will be tested restrained by the heavy panel frame, as they would be if supported by cross walls during an actual fire. Others will be unrestrained, being supported only at the bottom. In some of the tests the walls will carry their normal working load.

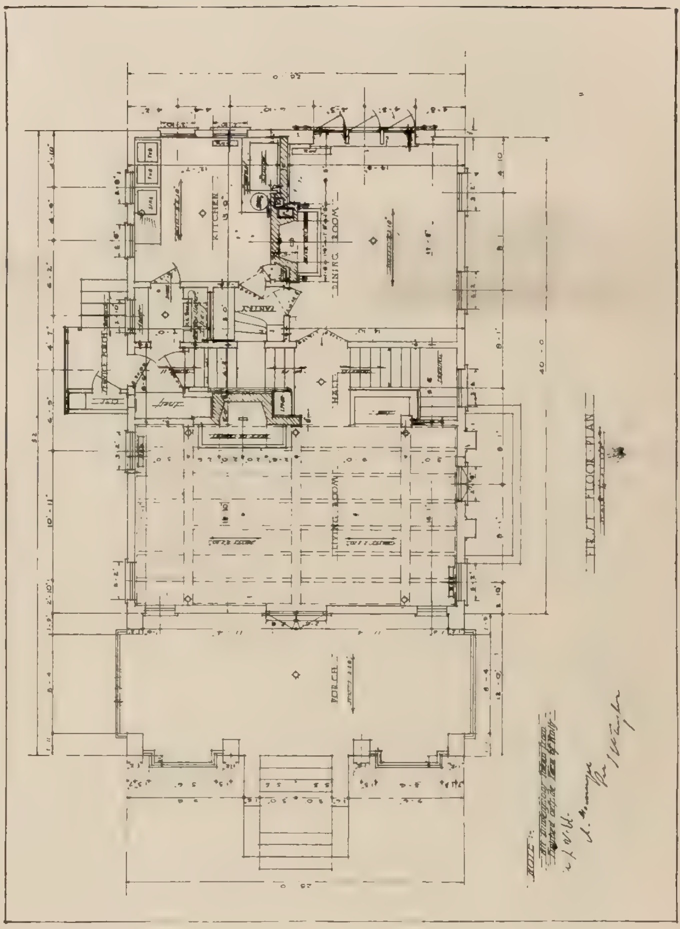
Other points found to add to the quality of tile are sufficiently fine grinding of the raw material, the even burning of the clay to normal hardness for that particular clay, the provision of sufficiently heavy shells and webs, and the use of ample fillets where the webs join the shell.

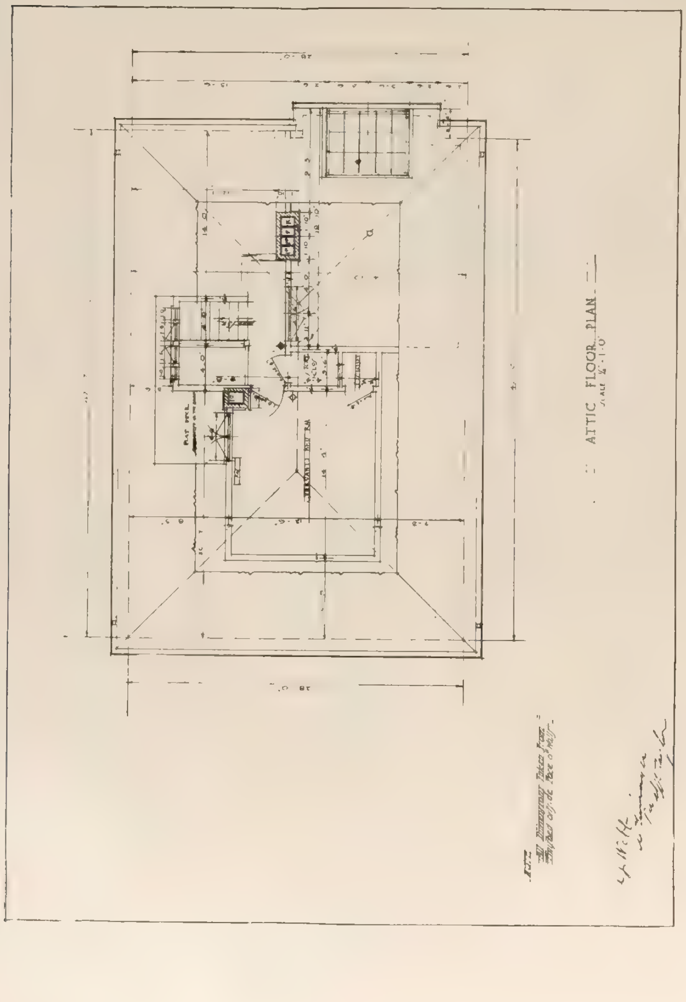


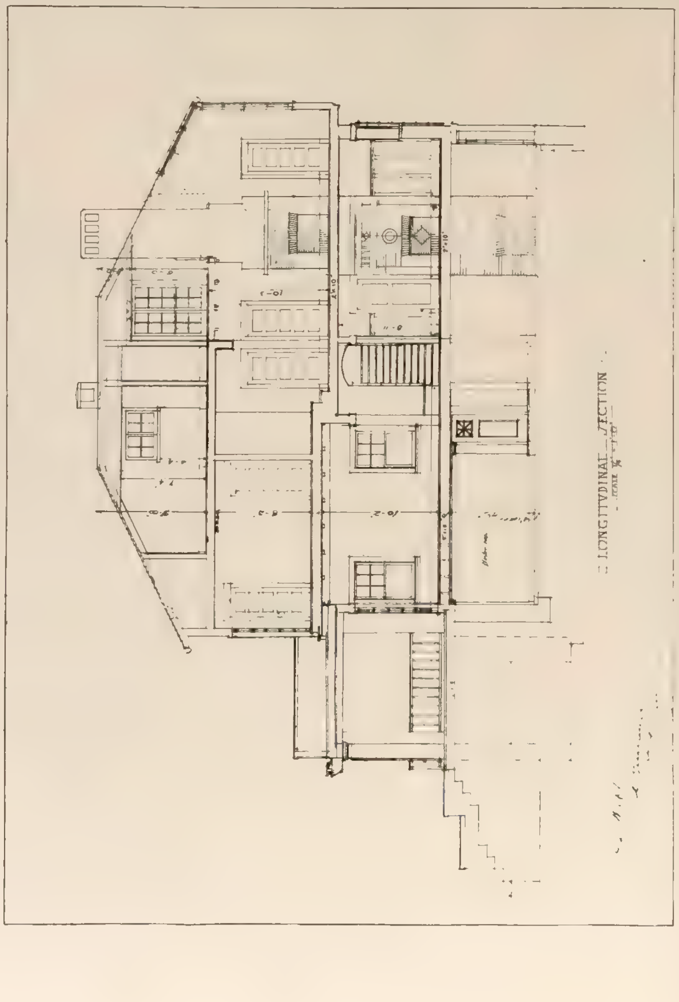


HOUSE, ALEXANDER GRINAGER, TUCKAHOE, N. Y. John H. Phillips, Architect.



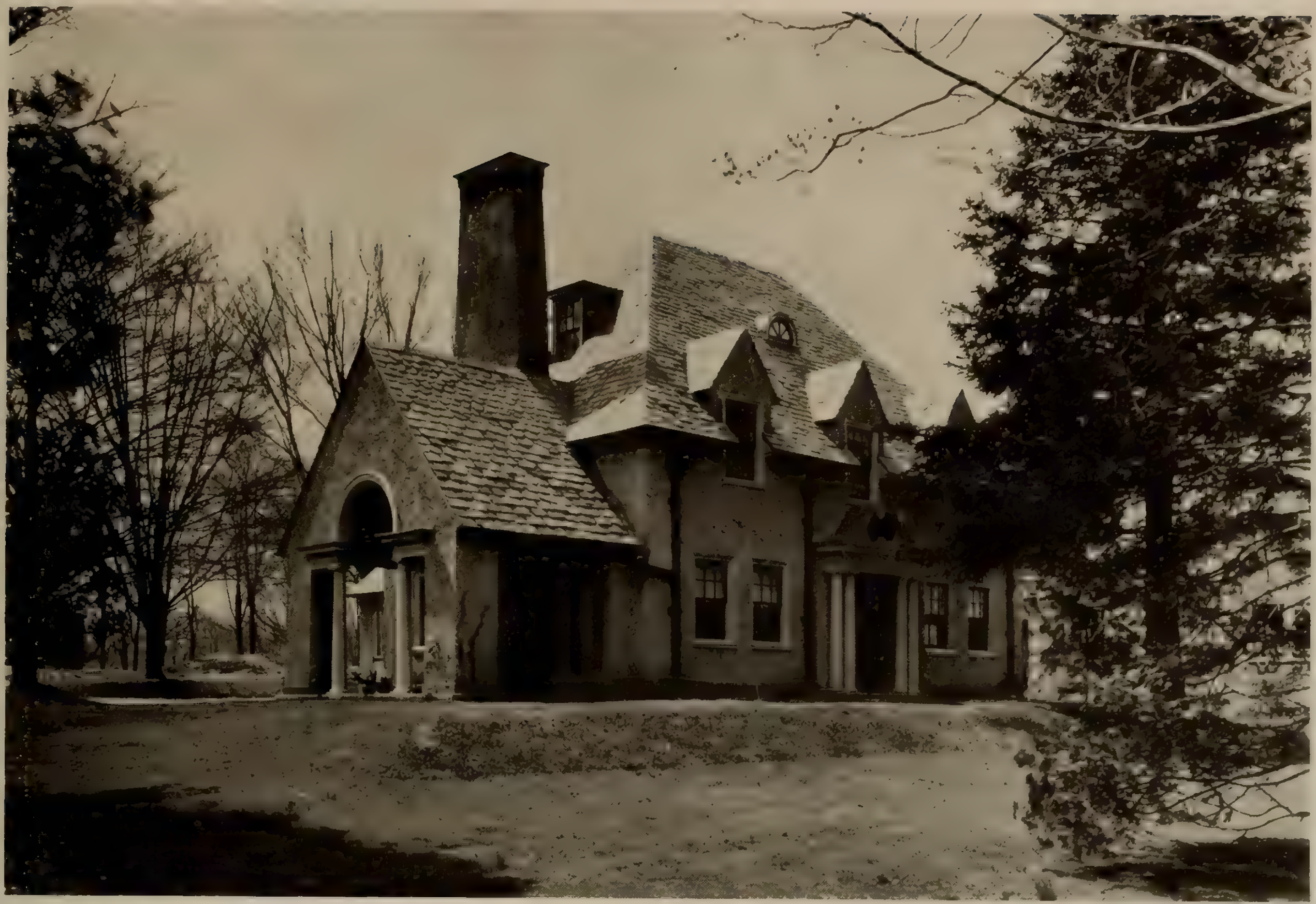


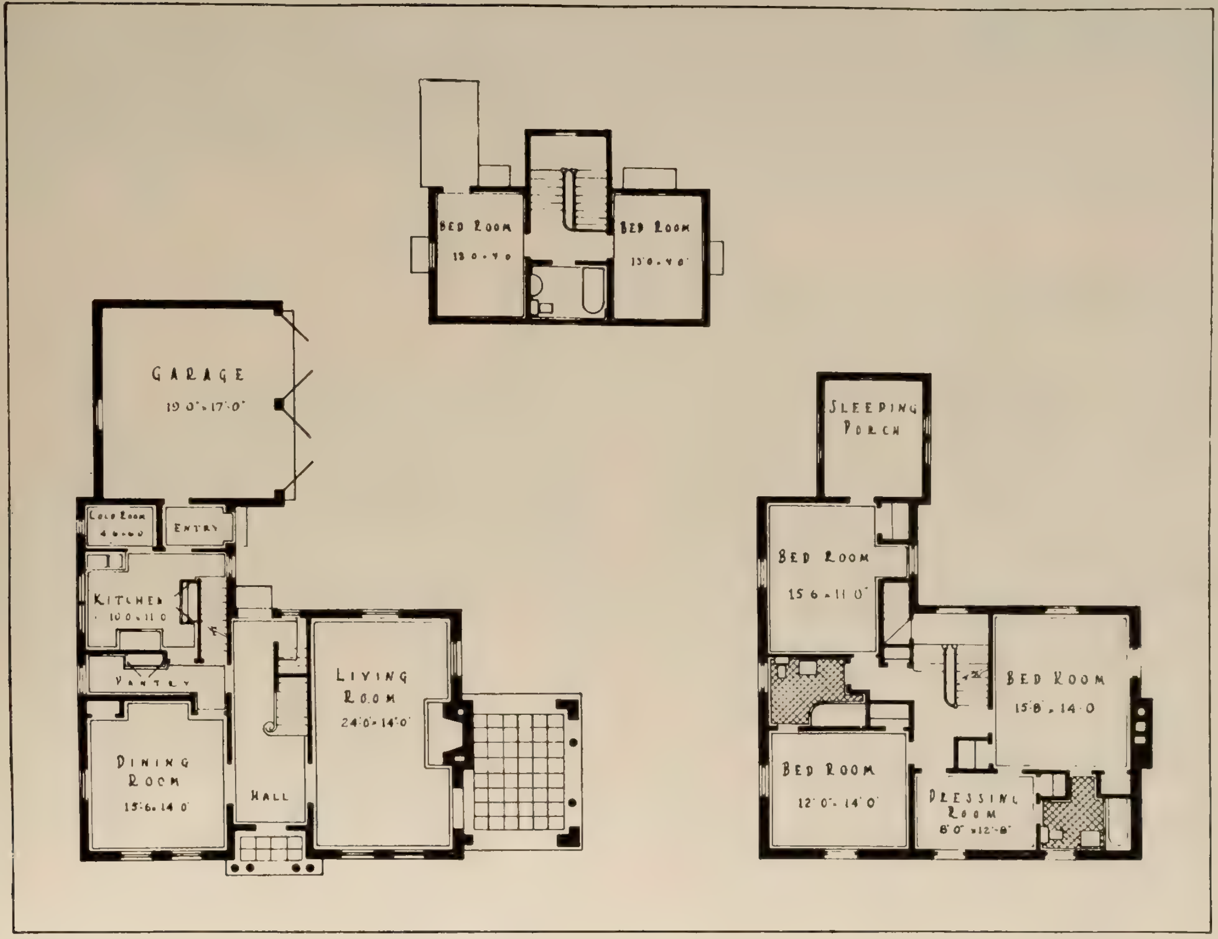




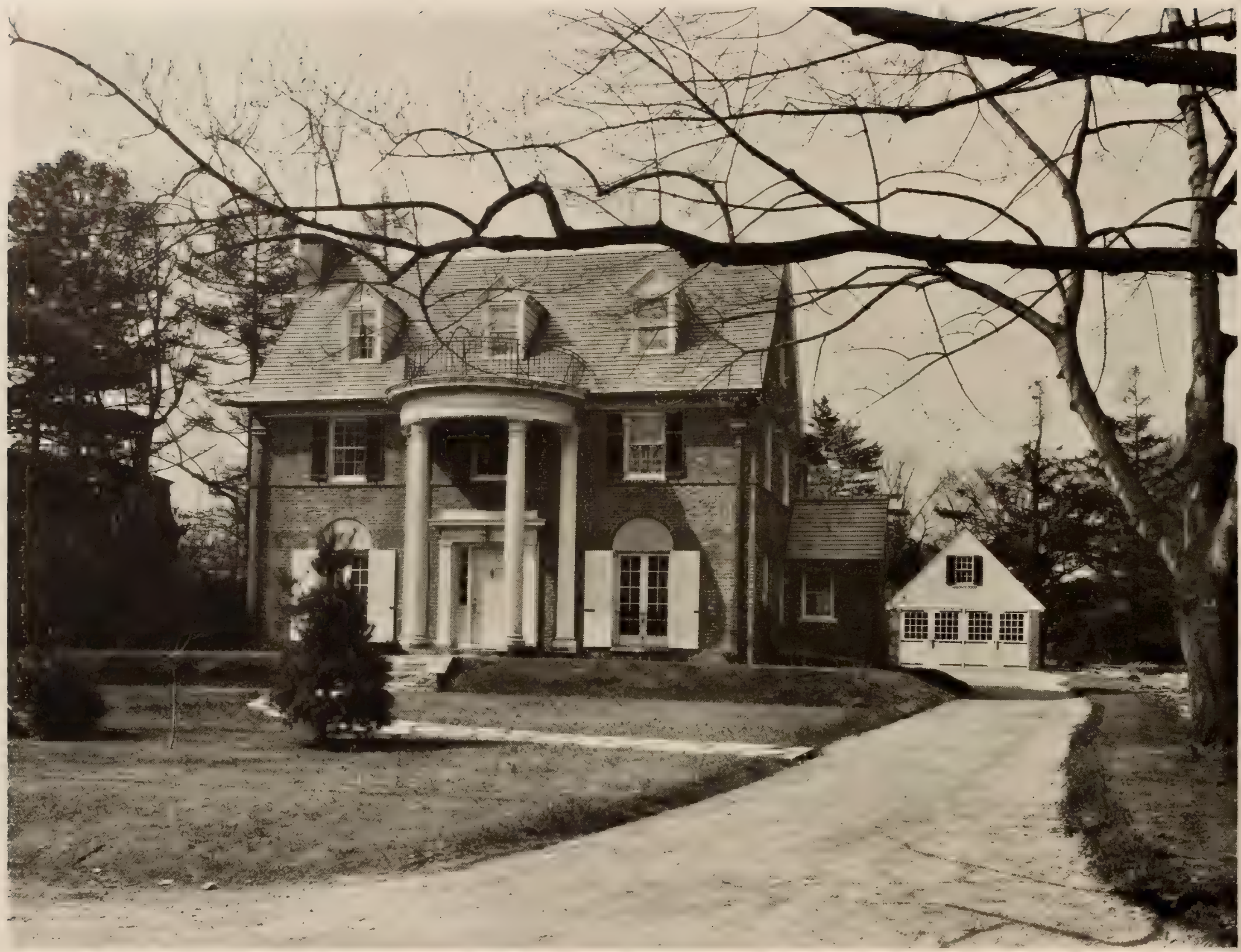
HOUSE, ALEXANDER GRINAGER, TUCKAHOE, N. Y.

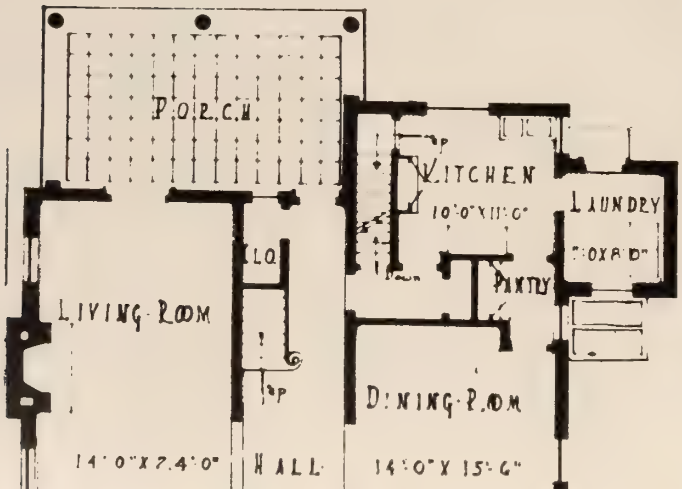
John H. Phillips, Architect.

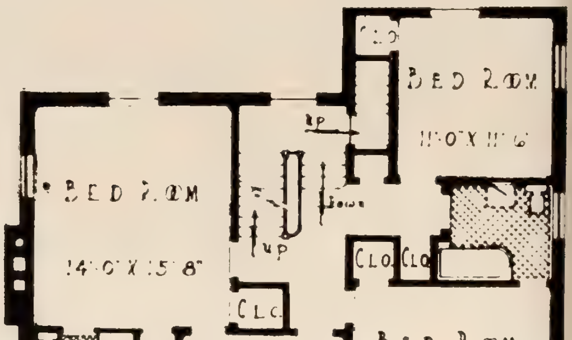




HOUSE AT ST. DAVIDS, PA. NOTE.—Plans are here reversed. Wallace & Warner, Architects.

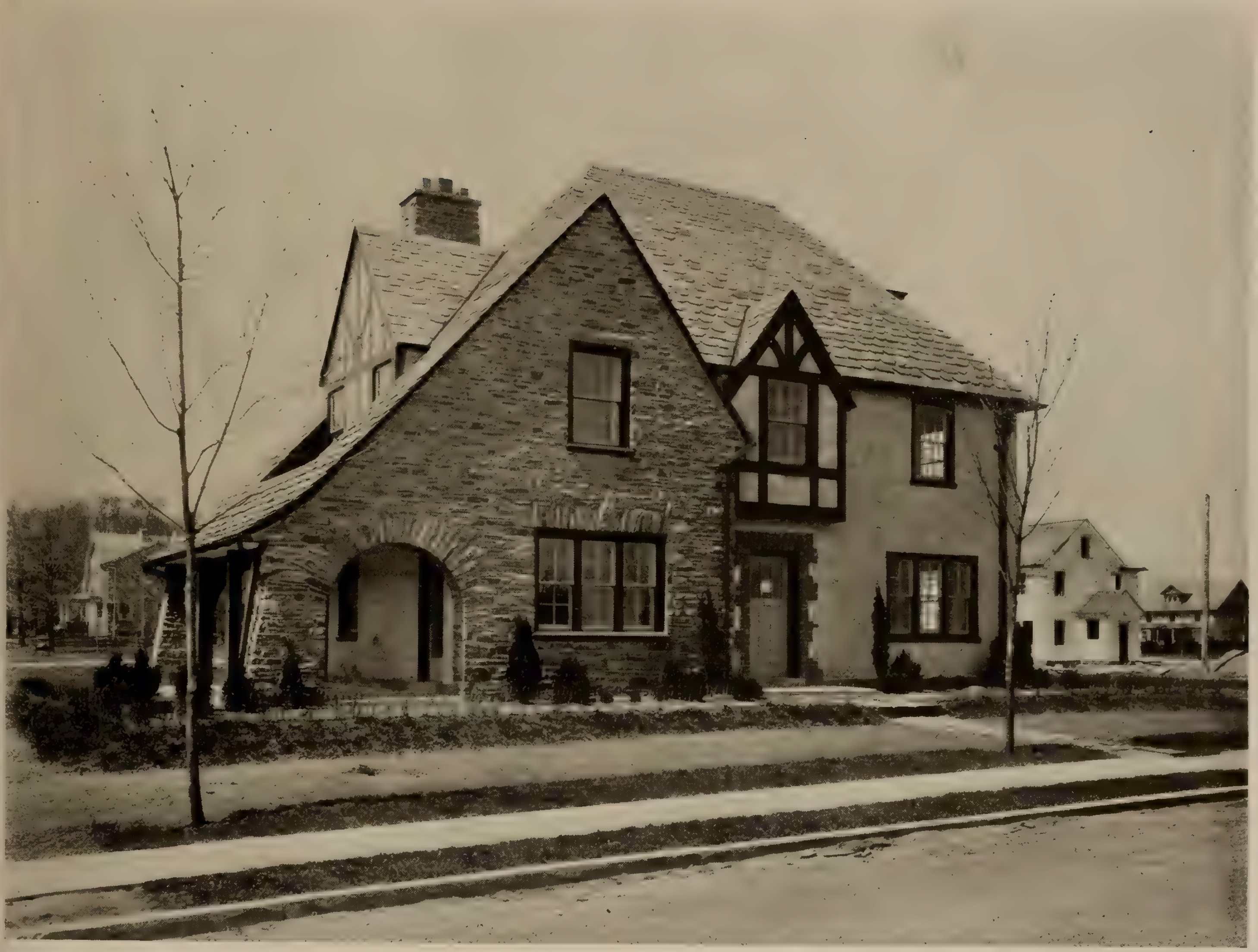


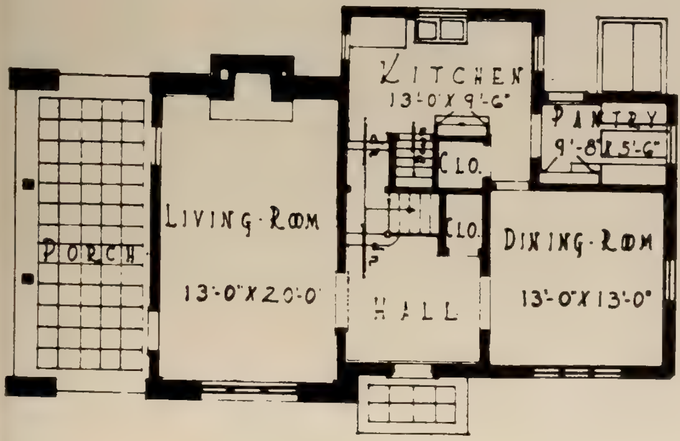


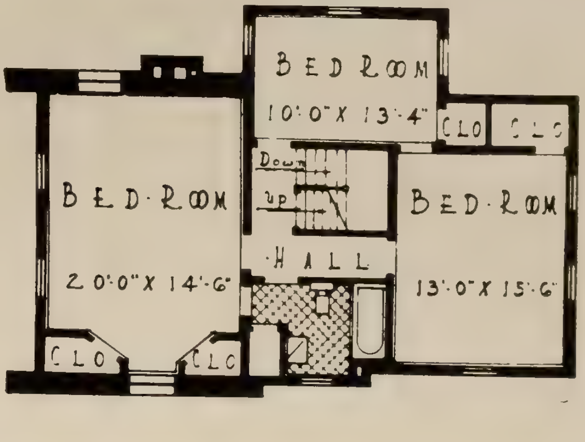


HOUSE, H. E. BETELLE, ROSEMONT, PA.

Wallace & Warner, Architects.

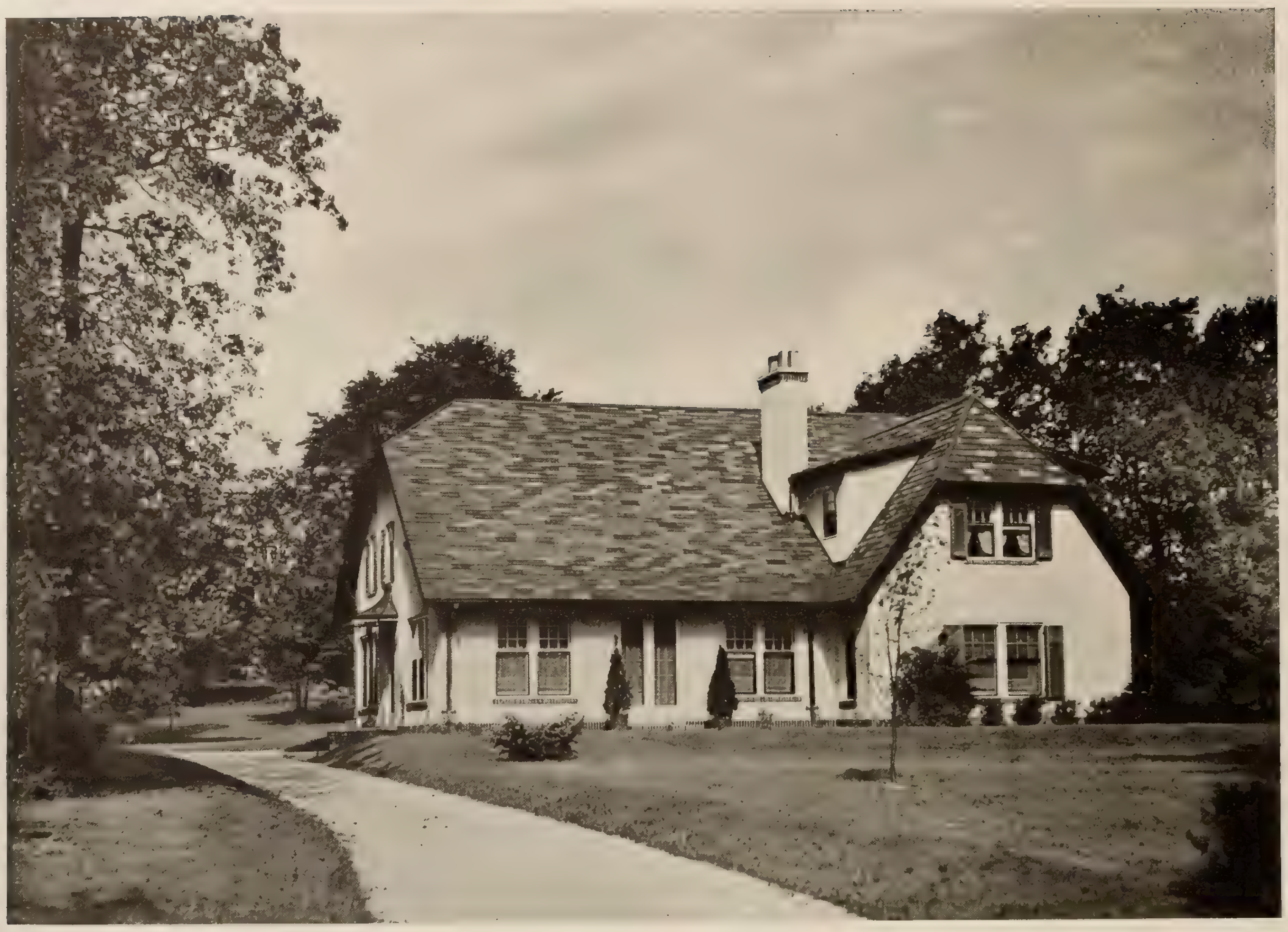


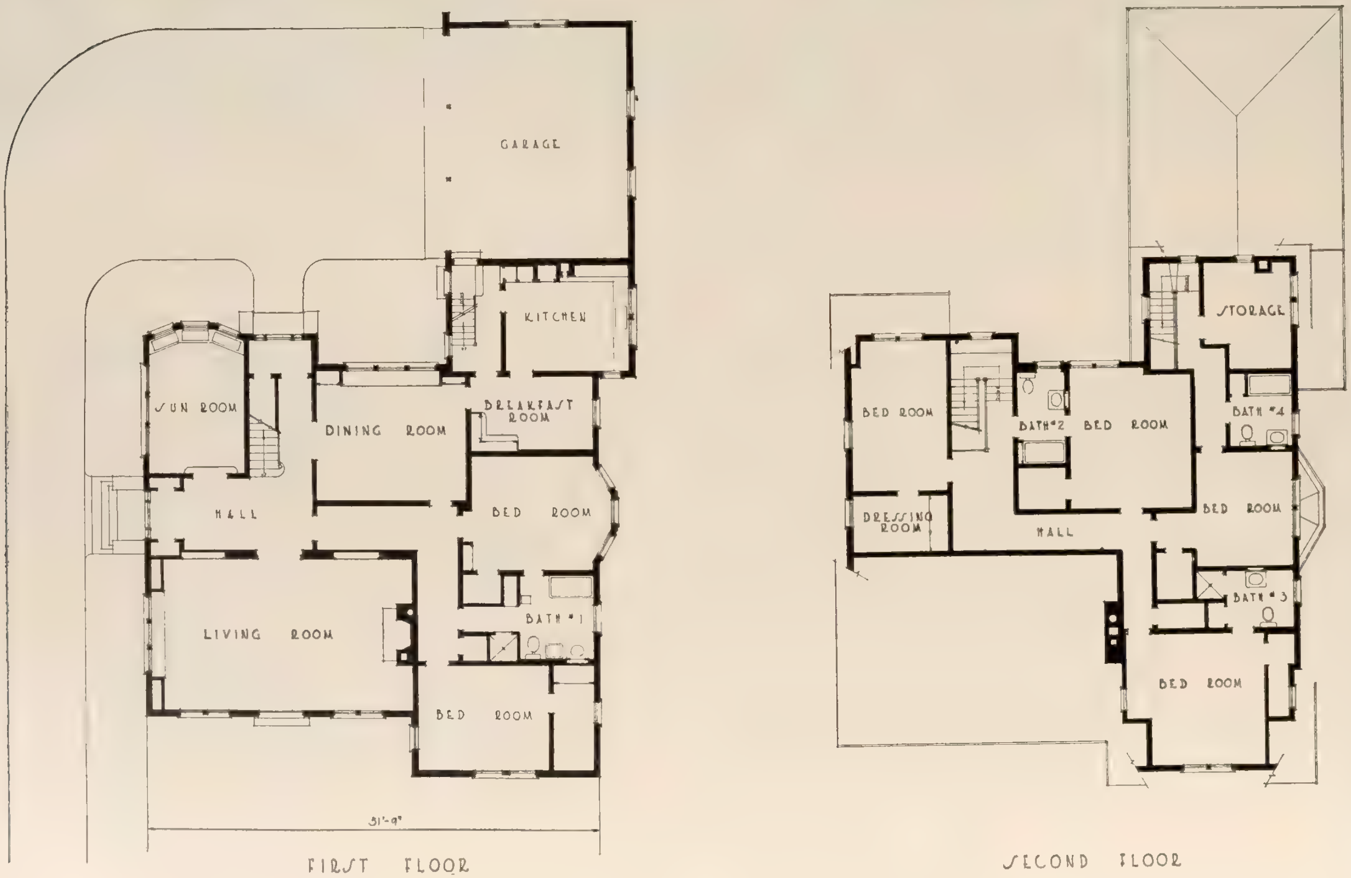




HOUSE, ALBERT SHORT, DREXEL PARK, PA.

Wallace & Warner, Architects.





FIRST FLOOR

SECOND FLOOR

RESIDENCE FOR O. B. ILES, INDIANAPOLIS, IND.

C. T. Myers, Architect.

An Architect's Simple Engineering Problems

By DeWitt Clinton Pond, M.A.

TENTH ARTICLE

IN the previous articles different types of floor construction have been gone into very thoroughly, and the reader should be able to design almost any kind of floor for ordinary structures by means of information given in them. Nothing, however, has been said of supports for floors such as walls, columns, and piers.

Under ordinary circumstances the supports for floors are the walls of the building and piers or columns in the interior. Skeleton construction, in which the exterior walls do not carry the floor construction but are actually carried themselves upon spandrel beams, is a method of building that has reached its greatest development during the last few years, but which is confined to the larger buildings. When skeleton frames are used the engineering problems encountered in the design are numerous and complicated, and an engineer's experience is necessary for design. However, great numbers of buildings are of a more modest type, and often the question of deciding upon the thickness of walls or piers of the sizes of columns is no difficult matter, and the architect need not call upon an engineer for aid.

Ever since the beginning of civilization men have used walls to carry the roofs under which they sheltered themselves. It is probable that all early methods of deciding upon the thickness of the walls were arrived at through experience, and no one will ever know of the failures of walls and lives lost due to early attempts to construct the equivalent of modern speculative construction. Even to-day the thickness of masonry walls is based upon good practice—arrived at through experience—rather than upon scientific experiments or calculations.

Very little need be said with regard to frame construction, for except in very rare cases floor loads in this type of building are so small that there is very little danger of failure due to lack of strength in the walls.

With regard to masonry walls, the thickness of these are usually specified in the building codes of the cities which have adopted building regulations. The architect or engineer who is familiar with the requirements of the codes of such cities as New York, Chicago, Cleveland, San Francisco, or cities of this type, are often astonished to find that there are many smaller communities with no codes at all. In such cases it is customary to fall back on the code of the nearest large city. As a rule there is very little difference between the requirements of the various ordinances, and the practices with regard to the thickness of masonry walls are largely standardized.

The New York Code is one that covers conditions in a manner that is characteristic of most of the others. In this code most of the conditions that are imposed upon masonry walls are provided for. The fact that the thicknesses are determined largely as a result of satisfactory experiences accounts for the walls of residence buildings being classified as different from those of public or business buildings. For long spans or unusual heights additional thicknesses are provided. The reasons for such classifications are obvious. Residences have lighter floor loads than business or public buildings, and where a long span exists between walls the loads at each end of the floor beams are naturally increased, requiring more substantial supports.

According to the New York Code the walls of small residential buildings may be 8 inches thick, provided such buildings are not more than 40 feet in height and the 8-inch walls do not exceed 50 feet in length between cross walls or adequate buttresses. As most houses do not exceed these dimensions, it is possible to use 8-inch walls in almost any type of country residences under such a ruling.

In residential buildings of a larger type, such as apartment-houses, when over 75 feet in height the walls must be 12 inches thick for the uppermost 25 feet, 16 inches for the next lower 35 feet, 20 inches for the next lower 40 feet, with a 4-inch increase for each additional lower section of 40 feet.

If buildings of this type are not over 75 feet in height the thickness of the masonry walls must be 12 inches for the uppermost 55 feet and 16 inches below that. The wall thicknesses given are carried to the nearest tier of beams to the heights specified. This makes it possible for a builder of an apartment-house 60 feet high to use 12-inch wall for all stories above the foundation walls. Foundation walls are required to be 4 inches thicker than the wall above them, so such walls would be 16 inches thick in any case.

In public or business buildings the thickness of brick walls is increased. For buildings 75 feet in height the uppermost 25 feet must be 16 inches thick, the next lower 35 feet must be 24 inches, and the thickness is increased 4 inches for every additional 40 feet.

When public or business buildings are over 60 feet but not over 75 feet in height, the uppermost 50 feet of wall must be 16 inches thick and 20 inches below that, and when over 40 feet but under 60 feet in height, the uppermost 20 feet of wall may be 12 inches thick and 16 inches thick below.

When buildings of this type are not over 40 feet high the walls may be 12 inches thick throughout.

These rules apply to brick walls of the ordinary type, and may be considered as minimum requirements. If stone walls are used, or ashlar facing, or if there are a large number of openings in the walls, or other conditions are encountered, as stated below, then the wall thickness must be increased.

It might be well to note that in accordance with the New York Code, walls of hollow building-blocks cannot be used as bearing walls in buildings over 40 feet high, but that the inside 4 inches of walls may be built of hand-burnt hollow brick of the same size or dimensions of ordinary brick. Furring blocks on the inside of masonry walls cannot be included in the measurement of the thickness of such walls.

In the ordinary brick-masonry walls the thicknesses given above must be increased if the clear span between bearing walls is over 26 feet, and 4 inches must be added to the wall thickness for every $12\frac{1}{2}$ feet or part thereof that the span exceeds this dimension.

To-day almost all walls are laid up in cement mortar, and under such conditions it is not necessary to make a masonry wall thicker on account of openings in it due to windows or flues, unless such openings reduce the horizontal area of the wall by 45 per cent. If the reduction exceeds 45 per cent, then 4 inches must be added for every 15 per cent or fraction thereof lost in the wall area due to such openings. If walls are laid in lime mortar, then the reduction in area cannot exceed 30 per cent, unless the thickness is increased, as stated above.

If walls are more than 105 feet long between cross walls or buttresses, they must be made 4 inches thicker for every 105 feet or part thereof it exceeds this length.

From what has been stated above it can be seen that if a wall is unusually long, or if there are many windows in it, or if the distance between it and the adjacent bearing wall is long, then it must be increased in thickness, but there is a provision in the Code stating that in case any wall is increased in thickness in accordance with one of the requirements given above, it will not be necessary to further increase the thickness unless, in the opinion of the superintendent of buildings, the safety of the wall demands it.

Ashlar can be included in the thickness of a masonry bearing wall provided it is laid up with alternate courses 8 inches thick, but a mere facing of face brick or 4-inch ashlar tied to the wall by clips cannot be considered in such thickness.

Masonry walls of brick as supporting walls must be of the thicknesses given. It can be seen that there is nothing scientific about the determination of the thicknesses. Ordinary engineering practice, as will be shown in later articles, requires that such determination is made upon the basis of first finding the loads, which rest upon the supports, and then developing the design of the columns or piers on the basis of the strength of the materials out of which they are made. However, it is probable that there can be no other method of developing wall thicknesses that would be of practical use.

Rubble walls must conform to still further limitations, as such walls, except for foundations, cannot be used in buildings over 60 feet in height. Walls built of rubble stone must have a thickness of 4 inches more than given above for the minimum requirements of masonry walls, and in no case can they be less than 18 inches in thickness.

Masonry piers are designed so that the proportion between the least dimension and height must be 1 to 10. In other words, a pier 10 feet high must have a least dimension of 1 foot.

Such thicknesses as are given above are subject to revision if there is any doubt about the stresses developed in the walls or piers due to the loads that must be supported. In a previous article the safe carrying capacity of brickwork laid in cement mortar was given as 250 pounds per square inch, and so, if there were any question as to whether a wall were strong enough to carry a given load, the area over which the load is carried could be found and this multiplied by the allowable stress. If the result is smaller than required to support the girder or floor load, the area of the supporting wall must be increased either by adding to its thickness or spreading the load by means of steel beams or plates laid along the wall.

This was taken up partially in a previous article in which plates were placed under beams that were framed into masonry walls. In some cases, often in school construction, plates are not sufficient, and steel grillages are used to support the ends of girders spanning across auditoriums or gymnasiums.

This design or a grillage of this type will be taken up in the next article. There is nothing particularly difficult about such work, as the problem consists of dividing the load by the allowable stress and by this method determining the area over which the load must be spread. If the wall is of a predetermined thickness, then the length which must be covered by grillage-beams is easily found by dividing the area by the thickness. The beams that cover this area act as cantilevers, with uniform loads pressing upward rather than downward. There is nothing new in such calculations. However, there are some cases where the loads at the ends of girders are great enough to cause failure through crushing. In this case the web thickness must be of such dimensions that the area of steel coming directly under the girder end will be great enough to support the load. In some cases it is necessary to use channels placed back to back in much the same manner as found in grillages under columns.

Walls as supports are usually not carried above six stories in height. When buildings are higher, then columns are used in the exterior walls to carry floor loads in the same manner as they are used in the interior of almost all buildings. In such cases the exterior walls become "curtain walls," carrying only their own weight. They may be 12 inches thick for the uppermost 60 feet of their height, increasing 4 inches in thickness for each next lower section of 60 feet.

In some cases, where it is desirable to be as economical in the use of steel as possible, walls are regarded as curtain walls for 60 feet of their height, and are carried on the steel frame-work above this height. In any case, the walls need not be more than 12 inches thick, and throughout the lower portion their weight is not carried by the steel.

Another Small-House Competition

McCALL'S MAGAZINE announces a programme for a small house, which challenges the ingenuity and resourcefulness of the designer.

The keynote is precedent, that is, proper precedent for a small house. It is not to be a mosaic of antique features, but a thoroughly modern house, in which has been inculcated the spirit of the old work in so simple a manner as to be readily recognizable, yet altogether reasonable in the light of modern improvements and use of materials.

The house must be a really *small* one, the cubage being restricted to 18,000 cubic feet.

The solution must be practical and the house buildable. The requirements and limitations in the programme have been carefully drafted with the object of securing this result.

Awards.—The author of the design placed first will receive a cash prize of $1,000. The second prize will be $500. The jury of award will also select a few designs which may be considered worthy of honorable mention.

Drawings Required.—1. Perspective and floor plans. A brief article justifying the selection of the particular precedent used and its application and calling attention to any special features. 2. Working drawings and specifications for use in construction.

Jury of Award.—The following architects have been engaged to assist in the conduct of this competition and they will comprise the jury of award: Alexander B. Trowbridge, New York; Edwin H. Brown, Minneapolis; John Russell Pope, New York.

The Problem.—A six-room house for a 50 by 100 foot improved inside lot of specified frontage; particular attention to be given to orientation.

Requirements.—The competition is educational in character—educational, not for the architect who is supposed to know, but for the laymen, on whom are continually foisted plans and houses of inferior character.

The competition closes October 31, 1925.

Drawings shall be delivered to Miss Marcia Mead, Consulting Architect to *McCall's Magazine*, 236 West 37th Street, New York, N. Y.

All architects and draftsmen of the United States are invited to participate in this competition.

Programmes may be secured from Miss Mead.

American Construction Council on Better Building

"ONE very serious situation confronting the country requires special attention. A large percentage of present-day building construction throughout the country is distinctly inferior in quality and unsound in financing. Thousands of such structures now under way or recently erected, especially in housing, are subject to such rapid deterioration that within ten years' time, sometimes less, they will be practically valueless. This rapid depreciation, coupled with unsound methods of promotion, must entail enormous loss on the principal investment, besides entailing serious expense and heavy additional burdens for repairs and maintenance after a few years. A still further burden is added by the higher rates of insurance due to the use of inferior materials and poor construction. All these make for higher rents.

"This situation results from the activities of irresponsible groups found in every element of the industry. Faulty engineering, unreliable architects, inexperienced and incompetent contractors, inferior grades of materials, poor mechanics, inadequate and poor inspection, and other bad factors too frequently enter into building work. These have serious effects but no more serious than unsound financing. Mortgage bonds are issued and on speculative buildings. Many such issues are based on improper security and fictitious statements of earnings at abnormal interest rates. They find buyers because of the general ignorance existing in many quarters as to the requirements for good real estate securities. Such purchasers are usually those who can least afford to be victimized. Every element of the industry must bear its proportionate share of the blame for the vicious practices not infrequently found in building projects to-day, and for permitting practices within its ranks that do not measure up to proper standards.

"To further the interests of the business of building and a general adoption of the principles of better building the Council has appointed a special and fully representative committee of men vitally interested in the desirable ends to be gained. This committee will make a survey of conditions and recommend correctives where deemed necessary.

"The Council's programme for the training of apprentices and the development of improved craftsmanship in the building trades is calculated to benefit greatly this situation. Apprenticeship is a national question and cannot be solved merely by treatment in isolated spots without regard to the other sections of the country and national needs as such. The American Construction Council, as the national body representative of all elements in the construction industry and the public and co-operating with the various localities and branches of the industry, thus has in its apprenticeship work a most effective means for furthering the principle of better building in addition to other desirable ends to be gained through apprentice training.

"The foregoing measures, combined with the Council's help in reducing the seasonal variations in building operations with their bad effects on quality of construction, particularly during the rush periods of the year, and its assistance in the promotion of organizations in the different localities of the country by bringing together the various elements of the industry in these sections as a part of its national movement to promote responsibility and intelligent co-operation in all of their aspects, furnish the basis for securing very practical results to industry generally and the public."

Starved Glue Joints

MANY failures in glued-up wood are caused by "starved" joints, or joints in which the film of glue between the wood surfaces is not continuous. Such joints, according to the Forest Products Laboratory, Madison, Wis., are not necessarily the result of a lack of glue spread on the wood; heavy spreads are as likely to produce them under ordinary commercial conditions as light spreads. They are caused rather by the application of pressure to the joint while the glue is too fluid.

Starved joints are more likely to occur with glues of low viscosity, such as warm animal glue and most blood albumin glues, than with casein, vegetable, and other thick glues.

Some woods are more susceptible to the production of starved joints than others. Birch, maple, red oak, and ash, which have open pores, absorb glue from the spread in such considerable amounts that they often leave the joints starved.

About the American Institute of Architects

WE have received an attractively printed folder, "Manual of the American Institute of Architects," that contains information concerning the purposes, requirements for membership, and plans for the development of this admirable organization. The institute is a power for good in advancing the best interests of the profession. The executive offices are in the famous Octagon in Washington, designed by William Thornton, 1761–1828.

Announcements

Charles Sheres, architect, announces that he is now located at 70 East 45th Street, Room 2613, New York.

The firm of Whinston and Hurwitz has been dissolved as of September 1, 1924. Mr. B. H. Whinston will open new offices at 6 East 46th Street, New York City. Manufacturers' samples and catalogues are requested.

G. A. Pehrson, Architect, Spokane, Wash., announces the removal of his office to 308 Spokane and Eastern Trust Building.

Andrew J. Sauer & Co., Architects and Engineers, announce the removal of their offices to the Schaff Building, northwest corner 15th and Race Streets, Philadelphia. They are organized to provide professional skill necessary for the development of any complex problems in the construction of buildings and complete equipment.

These are the days of great gifts to colleges for building, and certainly our collegiate architecture as represented by recent work at Yale, Princeton, the University of Michigan, Northwestern University, and other famous seats of learning may be looked upon as worthy contributions to the culture they are helping to spread abroad. James Gamble Rogers, the master builder of the Harkness Memorial at Yale, is the architect of the new buildings for Northwestern. With him will be associated hereafter the well-known Chicago firm of Childs & Smith, whose admirable work we have had the privilege of publishing a number of times.

Kansas City Life Insurance Co., Kansas City, Mo. Wight & Wight, Architects. Permanent floors of *Gold Seal* Battleship Linoleum installed by Bonded Floors Co.

UNITED STATES FIDELITY & GUARANTY COMPANY

BONDED FLOORS COMPANY

5-Year Guaranty Bond

A definite guarantee of permanent linoleum floors

A few architects who use Bonded Floors service

- Alfred C. Bossom
- Cass Gilbert
- Albert Kahn
- McKim, Mead & White
- Meade & Hamilton
- Kenneth Murchison
- John Russell Pope
- Starrett & Van Vleck
- Stevens & Lee
- Walker & Gillette
- York & Sawyer

It is not enough, nowadays, to provide quiet, foot-comfort and harmony in selecting floors for banks, business establishments, public buildings, etc. Your clients rightly consider the resilient floors as much a part of their permanent investment as the roofs and ceilings; and, as such expect durability—permanence.

A Bonded Floor of *Gold-Seal* Battleship Linoleum meets this most important requirement as satisfactorily as it does all others. Definite pledge of durability—built in by skilled workmanship and the use of only highest quality materials—is the Surety Bond. This Bond against repair expense is assurance of long and satisfactory service, and is obtainable with any Bonded Floor installed according to our specifications.

The architect's responsibility ends when he writes into the specifications that a Bonded Floor of *Gold Seal* Battleship Linoleum is to be installed—the owner to receive the Surety Bond, issued by the U. S. Fidelity and Guaranty Company.

BONDED FLOORS CO., INC.
Division of Congoleum-Nairn Inc.
New York · Boston · Philadelphia · Cleveland · Detroit · Chicago · Kansas City
San Francisco · Los Angeles · · · · · · *Distributors in other principal cities*

BONDED FLOORS
Resilient Floors for Every Need

When doors are open the lock plate of the Mechanical Interlock is thrown forward and around handle of the car controller, which positively locks it, and prevents operation of the car.

Electric Door Controller with cut-out switch in pit at bottom of elevator shaft. Pulley and weight — for controlling switch wires—are located in pent house.

Elevator safety *reflected in lower casualty insurance*

"Quality leaves its imprint"

The "Always Dependable Line"

R-W *Ideal* Elevator Door Hardware, so perfect in mechanical construction and faultless in functioning, is typical of any item of R-W manufacture. Hangers for fire, industrial, house, barn or garage doors embody all R-W requirements of mechanical excellence, and give the R-W standard of service—and there's none higher. The Engineering Department is YOUR department, ready to help you solve any doorway problem, and without cost or obligation. Use it freely. Let it carry your load.

R-W *Ideal* Elevator Door Hardware includes Electrical or Mechanical Interlocks. This absolute safeguard against the possibility of accident means a reduction of 10% in casualty insurance premiums. Equipped with it, no elevator door can remain open. R-W *Ideal* Elevator Hardware is silent, swift and sure. It includes closers and checks, hangers for single-speed, two-speed and three-speed doors; doors operating from both sides, and combination swing-out doors. Too much thought cannot be given to *elevator safety.*

Richards-Wilcox Mfg. Co.

"A Hanger for any Door that Slides."

AURORA, ILLINOIS, U.S.A.

New York Boston Philadelphia Cleveland Cincinnati Indianapolis St. Louis New Orleans
Chicago Minneapolis Kansas City Los Angeles San Francisco Omaha Seattle Detroit
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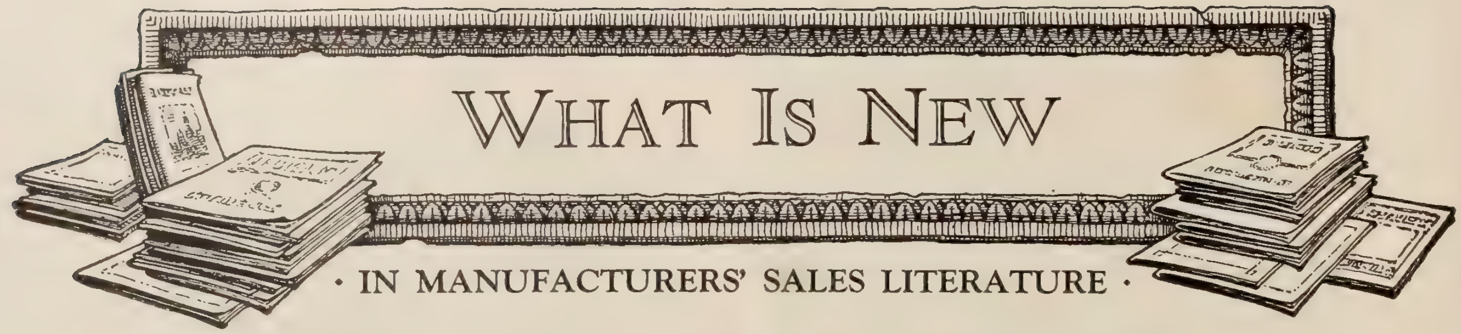


WHAT IS NEW

· IN MANUFACTURERS' SALES LITERATURE ·

Architects and every one interested will find here the latest and most up-to-date information on building equipment. These publications may be had by addressing SERVICE DEPARTMENT, ARCHITECTURE, 597 Fifth Avenue, New York, or by addressing the companies listed below, in which case please mention ARCHITECTURE

NEW SPECIFICATIONS FOR WATERPROOFING AND DAMPPROOFING

The Truscon Laboratories of Detroit, Mich., have just published new and revised specifications on all their Waterproofings in a 36-page book, size 8½ by 11 inches.

This book contains complete specifications on waterproofing mass concrete, waterproofing cement stucco, brick, masonry, also various dampproofing paints, oilproofings, and quick-set for concrete. Each specification is complete with full information how to use, quantity required, and illustrations.

This book is free to architects, engineers, and contractors desiring information.

DETAILS OF TIMBER-MILL CONSTRUCTION

Architectural designers and draftsmen will greatly appreciate a recent important contribution to technical information issued by the National Lumber Manufacturers Association, 402 Transportation Building, Washington, D. C., under the title, "Details of Heavy Timber Mill Construction." This bulletin, which is just off the press, illustrates good practice in heavy timber-mill construction detailing, and furnishes a distinct service not elsewhere available in compact and simple form.

A NEW TREATISE ON SCHOOL VENTILATION

A very instructive piece of literature has been issued by the Austral Window Co., 101 Park Avenue, New York, replete with specifications, drawings, and photographs, that has to do with better ventilation, control of light, and greater light area in schools.

The booklet says in introduction:

"Window ventilation for school buildings has steadily gained in popularity, with the result that the large majority of schools now being erected are provided with window ventilation.

"How extensively Austral Windows are being used in schoolhouse construction by prominent architects throughout the country, will be noted from the reproductions herein.

"The Austral Window provides a permanent source of health and comfort for those occupying the classroom, and that without any additional cost.

"It satisfies the demand of the present generation for good ventilation—for pure air without drafts."

Architects, draftsmen, specification writers, engineers, and students will find here data they want to know about and file.

RECOMMENDED BUILDING CODE

This code was first issued in June, 1923, by the Portland Cement Ass'n, 111 West Washington St., Chicago. While no important changes have been made, some sections have been modified in accordance with recent developments. For instance, publication of the new report of the "Joint Committee on Standard Specifications for Concrete and Reinforced Concrete" necessitated some changes in Section 45 in order that the code might conform to that report.

THREE BOOKS FOR THE ARCHITECTS' FILES

have been published by David Lupton's Sons Company, of Philadelphia:

"Lupton Casements of Copper Steel."

"Lupton Pivoted Sash."

"Lupton Steel Equipment for Factories, Stores, and Offices."

Each book is handsomely printed and contains valuable reference material.

HOW SHOULD YOU BUY A HEATING SYSTEM?

In introduction to this interesting folder which shows pictorially the elements which go to make up their business, Warren Webster & Co. say:

"Whatever type building you are interested in—the heating system is of first importance.

"The health and comfort of occupants, the operating cost, and the rental and resale value depend in large measure on an adequate heating system.

"When you want to buy a motor car you choose a *complete car* to meet your needs, and you depend on the maker to stand back of it—to *service* it. No one ever tries to "shop around" for better prices on carburetors, tires, lamps, and other component parts."

BONDED FLOORS, 1421 CHESTNUT STREET, PHILADELPHIA

has issued the following literature of interest to the profession:

The "Distinctive Floors" Series. Four pamphlets, illustrated in full color, each describing and picturing a resilient floor material, as follows:

(1) Battleship Linoleum. Explains the advantages and proper use of this durable, economical material.
(2) Treadlite Tile. Shows a variety of color and patterns.
(3) Rubber Tile. A description and color photographs of this colorful, marble-like, resilient tile.
(4) Natural Cork Tile. Description and color-plates.

Linoleum Specification. Folder, 8¼ by 11, 8 pp. Standard specification for installation of battleship linoleum, with detailed description and explanation. Also includes copy of Federal Government Specification No. 209.

Practical Working Specifications—for installing battleship linoleum, treadlite tile, rubber tile, and cork tile.

DELCO-LIGHT COMPANY, DAYTON, OHIO

have recently issued their new booklet on "Frigidaire" for the apartment-house. There has been a rapid growth in interest in electric refrigeration for the apartment-house as well as the single residence.

CONSTRUCTION PROJECTS ABROAD

Large Australian Department Store to Build Additions.

Plans have been completed for extensive alterations and additions to a large department store in Melbourne, Vice-Consul H. E. Coates, Melbourne, informs the Department of Commerce. The new company, which is to control this enterprise, is registered with a capital of £3,000,000. The completed structure will be eleven stories in height.

Large Orphan Asylum Project in Spain.

A provincial deputation recently voted to build an orphan asylum, capable of caring for 1,500 poor boys, on lands ceded by a town government, Consul A. W. Ferrin, Madrid, informs the Department of Commerce.

Office Building and Department Store in Brazil Planned.

An important department store has purchased a plot of ground in a Brazilian city and is drawing up plans for the construction of a modern office building and department store, the American Consulate, Rio de Janeiro, advises the Department of Commerce.

CONTRACTS IN VIRGINIA

The American Institute of Steel Construction says that one of its Virginia members was compelled to reprint all its contract forms for use in that State.

In 1920 the Legislature of Virginia adopted a statute which provides that any contract executed within the State of Virginia is not enforceable in the courts thereof, if it contains printed clauses or conditions which are printed in type of a size less than ten-point. In several instances where this law was tested in the courts, the statute has been upheld as constitutional.

ACROBATS OF THE SKYLINE

is an interesting article issued by the American Institute of Steel Construction, 350 Madison Avenue, New York. Its interest follows through the article, which begins with: "Hundreds of feet above the street a pigmy figure glides across a cobweb. Near by, one of his fellows leans far over nothingness to catch a glowing rivet, tossed casually aloft from the furnace. Another ant-man is driving home one of these rivets with a mighty clatter of air-gun, while still another pilots a girder into place as surely as though his feet were on solid earth instead of a hand's breadth of steel!"

This institute has also issued in pamphlet form discussions by J. H. Edwards, American Bridge Co., and John Brunner, Illinois Steel Co., of the recent address of Lee H. Miller, delivered before the American Iron and Steel Institute.

W. R. Sweatt, president of the Minneapolis Heat Regulator Company, announces the opening of a new factory branch office at Boston, Mass. The new office, located at 462 Boylston Street, will be formally opened about July 15th. George Kingsland, who was manager of the St. Louis Branch of the Minneapolis Company, will be in charge of the new office.

Late in May the Structural Slate Company, Pen Argyl, Pa., held a three-day sales conference, attended by the managers of its branch offices from all over the country. Questions dealing with contact with architects, workmanship, and the marketing of the new product, known as Struco Slate, were discussed at length. Another important point brought out at the conference was the necessity for making a revision and addition to the standard types of toilet enclosures and shower stalls, to meet changing conditions.

TERRA COTTA

Unsurpassed *for*

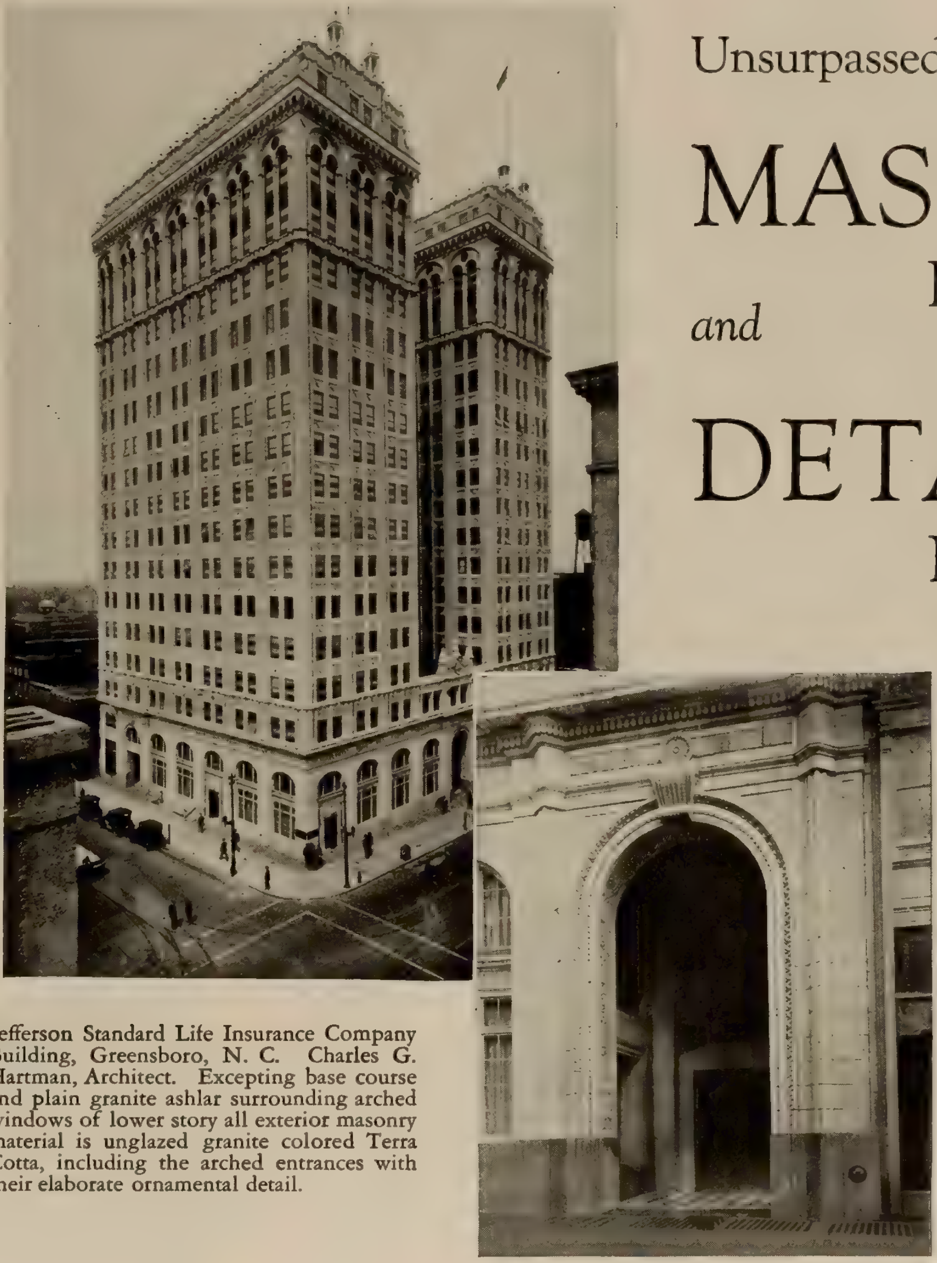
MASS

Effect

and

DETAIL

Beauty



Jefferson Standard Life Insurance Company Building, Greensboro, N. C. Charles G. Hartman, Architect. Excepting base course and plain granite ashlar surrounding arched windows of lower story all exterior masonry material is unglazed granite colored Terra Cotta, including the arched entrances with their elaborate ornamental detail.

Economy, durability and beauty of effective mass coloring all make Terra Cotta pre-eminently the logical material for the main exterior finish of the modern office building.

Literature on color and appropriate precedent with Standard Specifications covering the proper manufacture, furnishing and setting of Terra Cotta will be furnished on request. Address:

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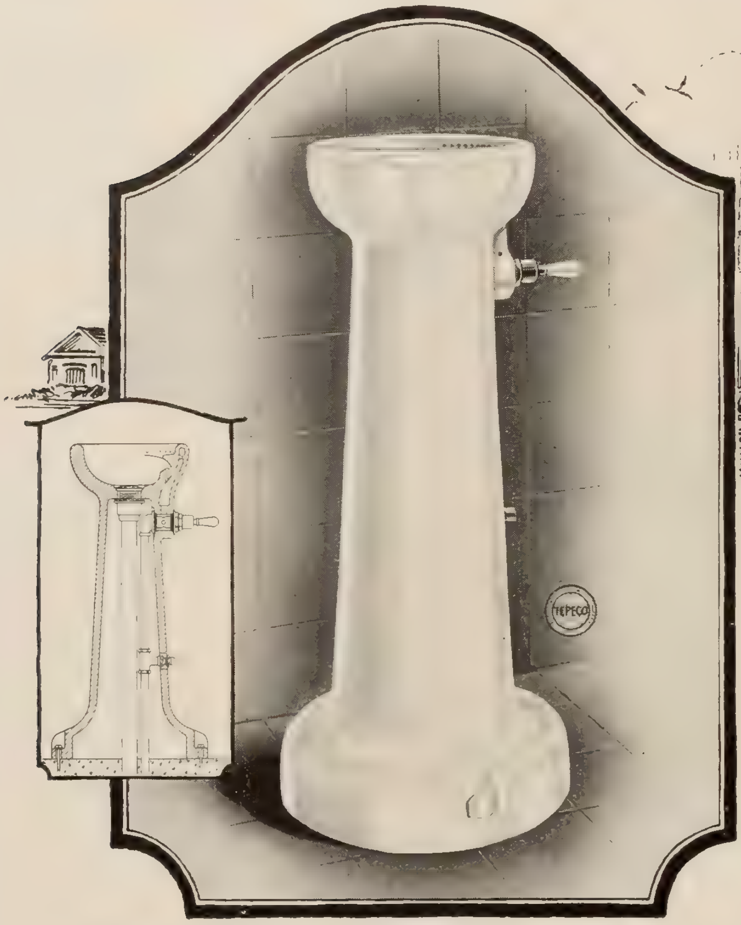

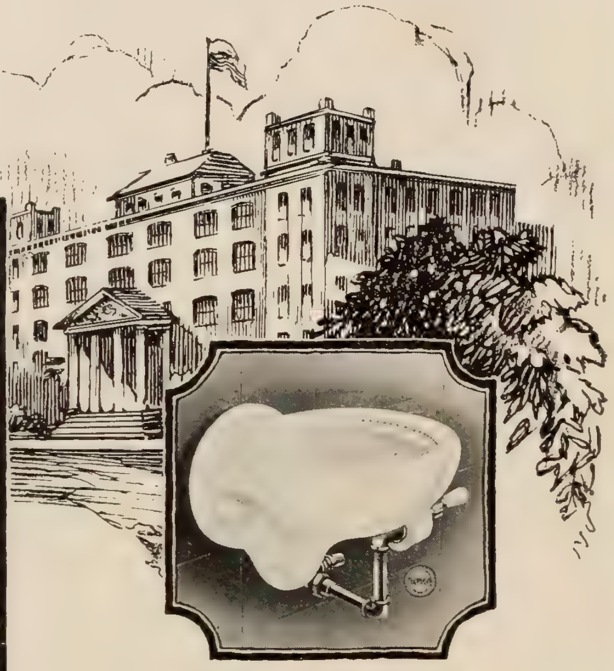

"Premier" Fountain. Mounted on concealed adjustable clip hanger. Two-fire vitreous china. Integral side stream nozzle.

There's no "Danger Line" on 'TEPECO' Fountains

THE raised Integral Side Stream Nozzle, guarded by Self-flushing Integral Sanitary Ledge as developed on the fountain illustrated above, is the most sanitary drinking device obtainable.

The flushing rim washes the ledge continually while the fountain is in use, preventing the danger of contact with a dry surface. Construction of the supply chamber keeps stream at a uniform height. Note in the cross section how waste and supply pipes are concealed in pedestal.

A wide range of designs and prices enables you to select the *right* fountain for every purpose.

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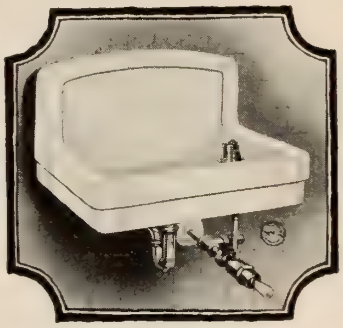

"Tuxedo" Fountain. Mounted on concealed bar hanger. Two-fire vitreous china. Integral side stream nozzle.

"Cadwalder" Fountain. Fitted with china bubbler, self-closing, oscillating handle valve. Two-fire vitreous china.

TEPECO
ALL-CLAY PLUMBING FIXTURES

A home in the Country Club District, developed by J. C. Nichols Investment Co., Kansas City, Mo. Van Brunt and Hertz, Kansas City, Architects; U. S. Water & Steam Supply Co., Kansas City, Plumbing Jobbers; Kansas City Plumbing & Heating Co., Plumbers

WHENEVER the roll is called of America's finest residential developments, the famous Country Club District of Kansas City is certain to be named among the first.

In a large proportion of the homes in this district, the J. C. Nichols Investment Co., its developers, have used Kohler Ware. In the typical house illustrated above are two "Viceroy" built-in baths, two pedestal lavatories, and a twin-drainboard sink of Kohler make.

The beauty of Kohler Ware and the quality and uniform whiteness of its enamel—always signed with the name "Kohler"— make it a fitting choice for the finest homes; just as its reasonable cost suggests its use for less expensive installations.

In Kohler Village

To the beauty of the homes of Kohler Village is due in no small measure the quality of Kohler products — enameled plumbing ware and private electric plants

Kohler Co., *Founded 1873*, Kohler, Wis. · *Shipping Point*, Sheboygan, Wis.
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KOHLER OF KOHLER
Enameled Plumbing Ware

AMBRAC METAL eliminates upkeep

The new
Kawneer
COMPANY
all-metal, rustless casement and weight-hung windows are fabricated from Ambrac Metal. They are permanently weather-tight.

AMBRAC Metal does not require paint, for it is rust-proof. This quality, together with its fine grain structure and natural smoothness of finish, makes the lubrication of movable parts unnecessary. Whether exposed to the weather or not, Ambrac Metal eliminates upkeep.

Ambrac Metal is composed chiefly of Copper and Nickel. It is a beautiful metal, white clear through with the surface assuming a light green tint on exposure. It is so ductile that it can be worked into any desired shape, yet it has the strength of mild steel, and will last indefinitely.

Ambrac Metal was developed by The American Brass Company to fill a long-felt need for a strong white metal highly resistant to corrosion. Architects find it especially appropriate for windows, door frames, grille work and general metal trim.

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Philadelphia, Providence, Pittsburgh
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from mine to consumer

Mills and Factories:
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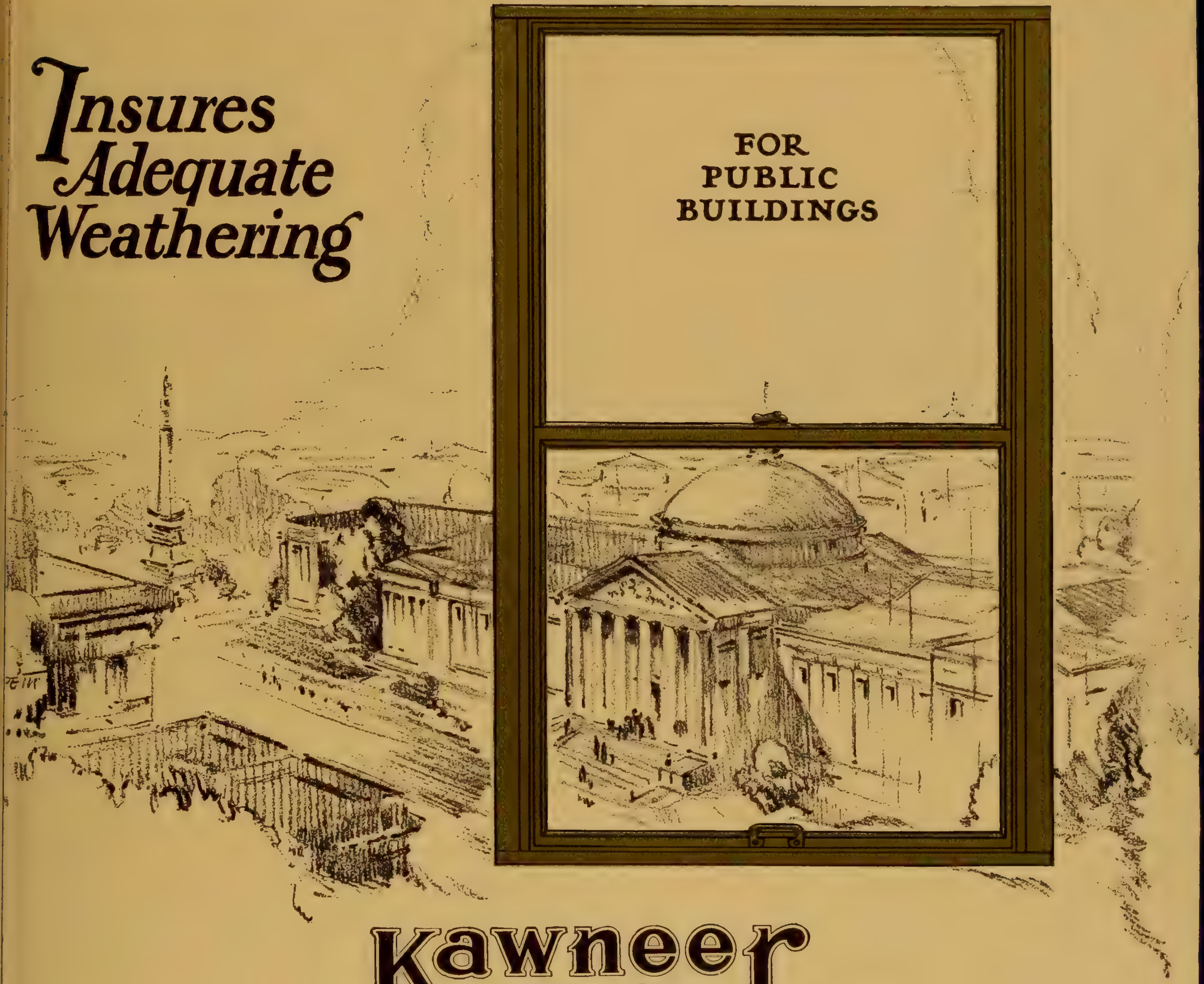

Kawneer
Solid Nickel Silver
WINDOWS

More than 20 years ago The Kawneer Company designed and marketed the first Rustless Metal Store Front. Now The Kawneer Company is offering the first Rustless Nickel-Silver Window. Fabricated to size in the modern plant shown on the reverse side of this page, Kawneer Nickel-Silver Windows, in addition to many other features offer:

Permanency—being made of Nickel-Silver they will not rust nor corrode, in fact, will outlive the best constructed buildings.

Adequate Weathering—this is provided by the heavy gauge, specially designed, interlocking members.

Continuous Satisfactory Operation—this is assured by using Solid Nickel-Silver with all joints thoroughly welded.

Complete details and specifications will be sent upon request or full size models shown.

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STORE FRONTS

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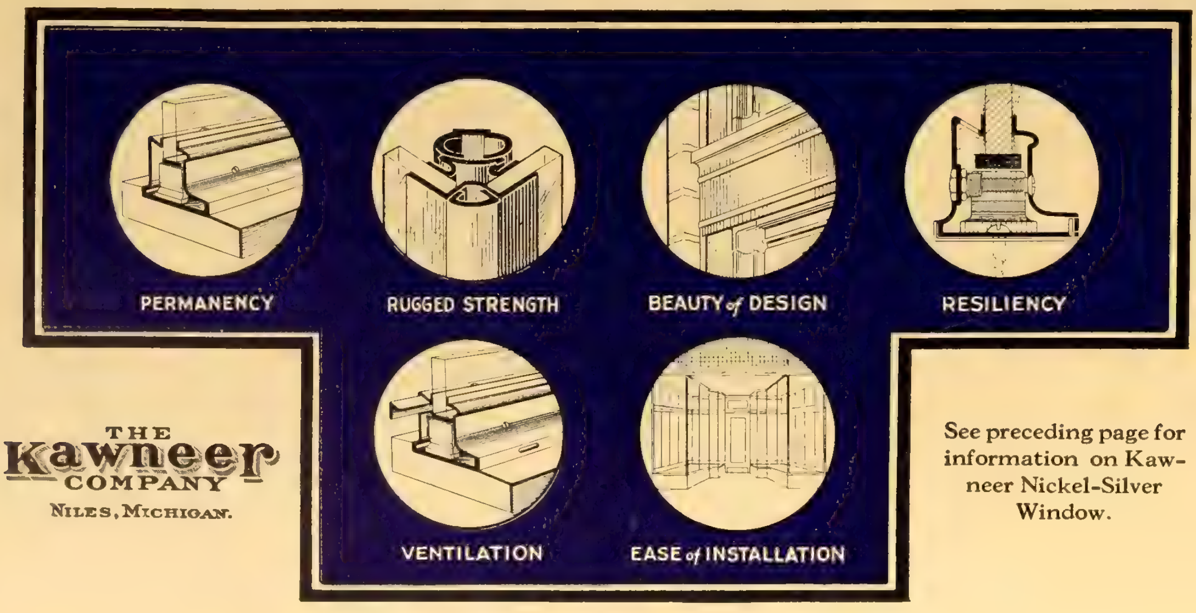
manufactured

More than 260,000 Store Fronts Produced in Twenty Years

This large industrial plant is the result of Kawneer foresight and pioneering in Copper Store Front construction.

Designed by an architect who had specialized in the construction of business buildings, Kawneer Solid Copper Store Fronts met with immediate favor. Now you can name no line of business that Kawneer Fronts have not benefited. They have not only added beauty and visibility, but have actually stimulated sales for Drug, Shoe, Hardware, Motor Sales, Electrical, Furniture, Jewelry, Women's, Men's, and scores of other retail stores. Kawneer Booklets assist in laying out your Store Front plans. Write for copies today.



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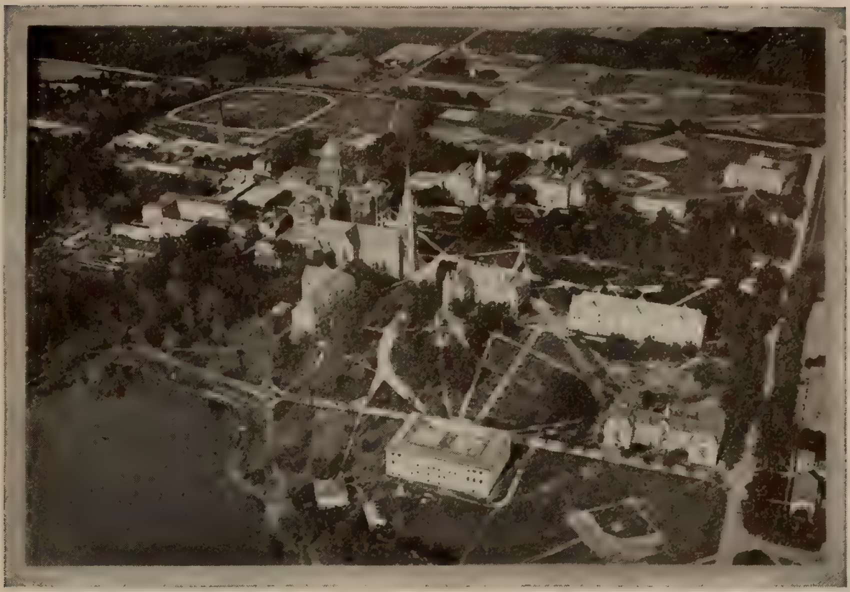
NILES, MICHIGAN.

See preceding page for information on Kawneer Nickel-Silver Window.



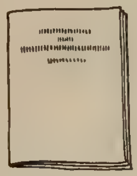
Aerial View of the University of Notre Dame, Notre Dame, Ind. Founded 1843. Present enrollment more than 2100 students. This large group of buildings is heated thruout by a Webster Vacuum System of Steam Heating from a central heating plant.

"—dated June 27th, 1899"

THERE is a wide difference between sales and service—a wide difference between promise and performance . . . . . . *Witness:* the Webster Vacuum System installation at the University of Notre Dame.

The first proposal for a Webster Vacuum System was dated June 27th, 1899. The first Webster installation was completed in 1900 and contained 16,913 square feet of radiation . . . . . . And then—twenty five years of Webster Service . . . . . . As additions and changes were made the Webster Vacuum System kept pace with the growth of the institution. New developments in the art of heating were promptly incorporated as the system was extended to all the new buildings. Today this 25-year-old Webster Vacuum System of Steam Heating is thoroughly up to date and contains 99,080 square feet of radiation.

We would like to give you the inside facts on Webster Service . . . . . We would like to tell you how Webster Service is working *with* architects, engineers and their clients—getting on the job at an early stage in the planning and never quitting during the life of the installation.



Technical Description Sent on Request

Are you interested in large Vacuum System installations? *A technical description of the Webster Vacuum System installed in the Shelton Hotel will be sent to architects or engineers on request.*

Warren Webster & Company

Pioneers of the Vacuum System of Steam Heating

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Seamless One-Piece Multiflex Metal Bellows

are a fundamental part of Bishop & Babcock Heating Specialties and Temperature Regulation. In the manufacture of these vital parts for the construction of thermostatic traps, valves, and other devices, The Bishop & Babcock Mfg. Co. exercise the same care and rigid adherence to high standards that characterize all of their products.

The Company is entirely independent of all outside sources of supply for delivery of the finished product and the responsibility for perfection of the article. Bishop & Babcock Multiflex Bellows have always been made in our own plants. You can depend on products which carry with them the trade name MULTIFLEX.

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HEATING SPECIALTIES

For window comfort and smart appearance

THE comfort of a great newspaper staff, working under high pressure 24 hours a day, as well as the imposing appearance so important to the home of a prominent journal, undoubtedly governed the choice of Lupton Double Hung Windows for this modern skyscraper.

The dignified beauty, weather-tightness and easy operation of these galvanized steel-plate windows have led to their widespread adoption for many other high-grade office buildings, large and small, where efficiency and comfort must be attained.

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The Elverson Building, Philadelphia. Rankin, Kellogg & Crane, Architects. Roydhouse-Arey Co., Contractors. Home of The Philadelphia Inquirer.

While various Lupton Steel Sash products are used throughout this enormous plant, we particularly wish to emphasize the specification of nearly 400 Lupton Double Hung Windows in the office elevations

843

Fenestra for

Built to Satisfy

—the Apartment Owner
—the Apartment Dweller
—the Architect

The apartment *owner*, is the first person to be satisfied with the windows. He recognizes that bright, well ventilated, cozy rooms help rent the apartment. He sees an investment value in windows of steel that are fire-resistant as well. But he watches the cost. And when he finds that Fenestra Casements give him these investment and quick rental advantages *without adding to the cost of the building*, HE'S SATISFIED.

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Architect: Julia Morgan

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Casement Windows Apartments

ing and easy operation, an abundance of light without eating up too much wall space and thorough ventilation are some of the Fenestra advantages which influence the renting of apartments.

The *architect* wants the owner and the dweller to be satisfied. But he must be satisfied himself—the windows he chooses must add to the architectural beauty of the structure, they must harmonize with the decorative motif of the building, and they must be fully suited to the type of construction selected and completely conform to other details of the building. That Fenestra Casements do meet with these rigid requirements of the architect is evidenced by their use in beautiful apartments in every section of the country.

When any building material has these three-fold points of satisfaction, isn't it worthy of your consideration? Why not let us send full information?

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Architect: L. S. Beardsley

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THE staunch endurance and arresting beauty of old world tile roofs command the reverent regard of architects and the lively admiration of travelers.

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  True Spanish Mission Style
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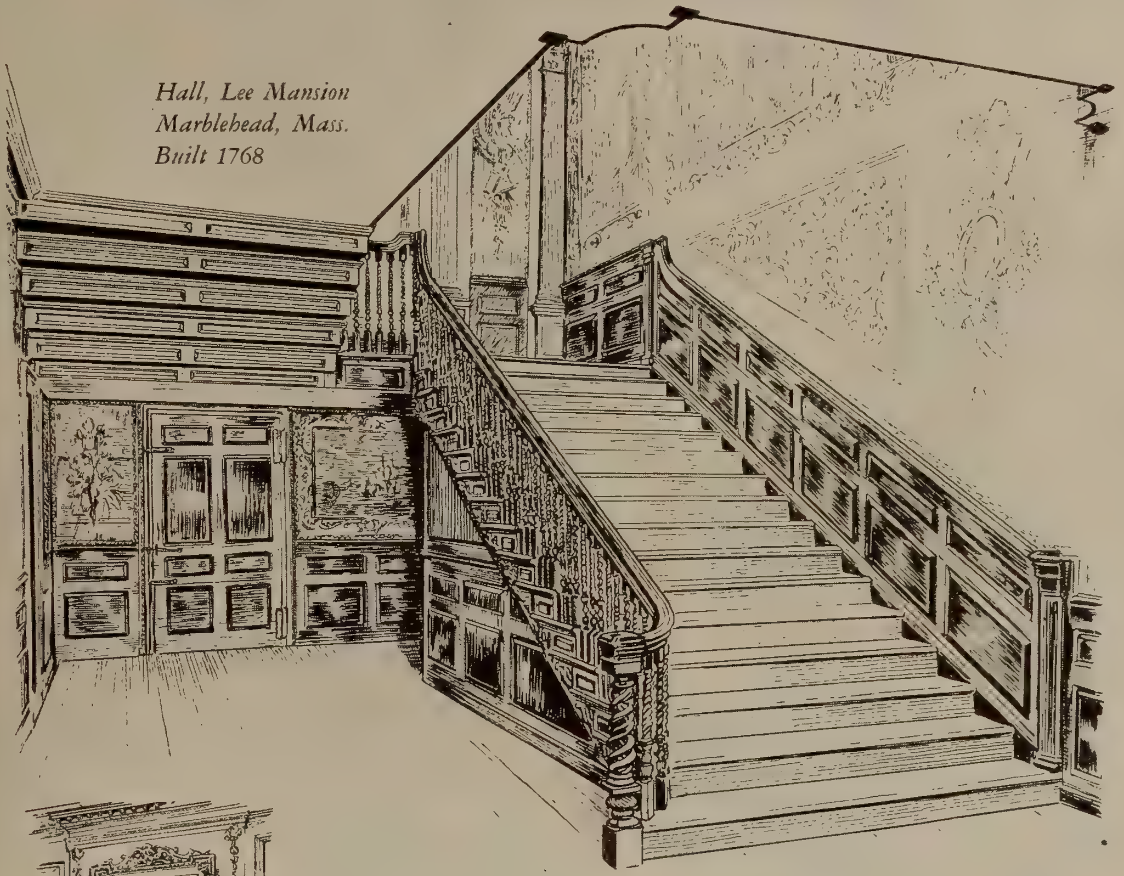
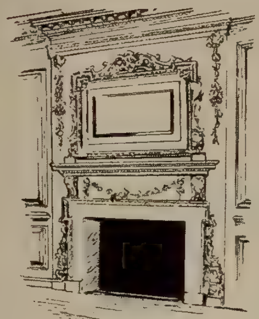
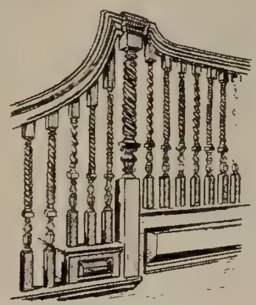


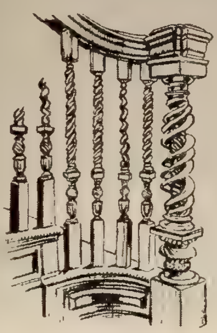
Hall, Lee Mansion
Marblehead, Mass.
Built 1768



Mantle, Lee Mansion



Baluster, Lee Mansion



Newel-Post,
Lee Mansion

WAY back in the days when the United States was still a British Colony, the firm of Devoe had its inception. 171 years have passed since then. Each year has added naturally to Devoe's experience; each year has more firmly established the Devoe Tradition of Quality.

And so it is that architects who specify Devoe Paint and Varnish Products can be sure of their unquestionable quality.

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BUILD WITH ARCHITECTURAL TERRA COTTA

This illustration shows the 10th, 11th and 12th stories of the Frank & Seder new building at Market and 11th Sts., Philadelphia, Pa. The Ballinger Co., Architects and Engineers, Philadelphia, Pa.

This building is faced and trimmed with our Architectural Terra Cotta done in an Old Ivory Matt Glazed finish from top of first story to top of parapet.

Consult us with your Terra Cotta problems without obligations. Our technical departments are always at your service.

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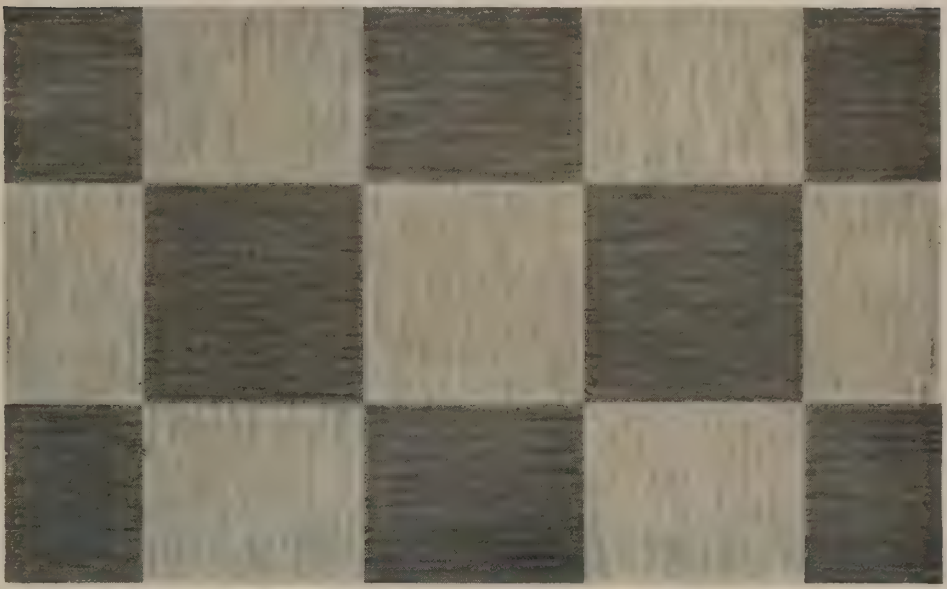
Nobel and Newson, San Francisco architects, chose this marble inlaid floor of Armstrong's Linoleum for the Henshaw apartment in the fine Francesca Apartment Building

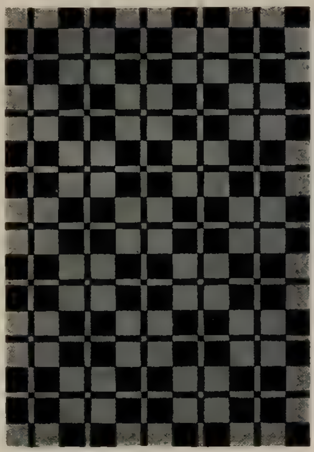
Marble Inlaid No. 78, a twelve-inch block design in two beautiful tones of gray



Room beauty begins with floor beauty

Some interiors are mere accidents, but not the one which is based on a floor of color and design

THE architect or decorator who realizes what style and charm a patterned floor of Armstrong's Linoleum contributes to a room, happily turns a difficult problem into a source of inspiration.



Moulded Inlaid No. 5431

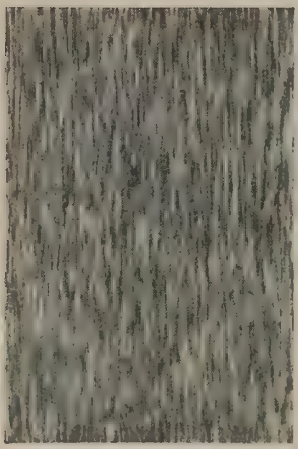
What makes these new floors really beautiful? First, it is their colors—rich, lustrous colors, yet softly subdued colors—colors harmoniously combined to suit any decorative need.

Second, it is their design, their smartly modern patterns conceived by expert designers and approved by decorators and architects as the last word in floor beauty.

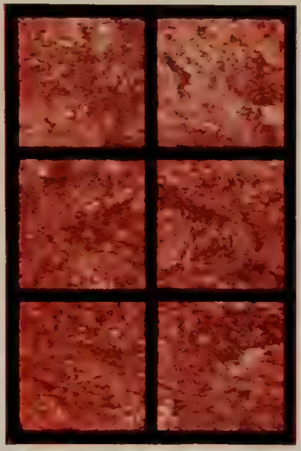
There are scores of attractive designs to choose from. Let your imagination have full sway. You will find an Armstrong's Linoleum floor to add just the right touch of color to any decorative scheme you have in mind.

Armstrong's Linoleum floors have always been ideally suited for business use. Their long life is one reason. The fact that they cut cleaning costs is another reason.

Once permanently cemented in place over a lining of heavy deadening felt, all an Armstrong's Linoleum floor needs, in office, shop, or home, is a daily cleaning with a dry mop and an occasional waxing and polishing.



Light Gray Jaspé No. 13



Inset Marble Tile Inlaid No. 61

Let us send you a section of this new Armstrong's Linoleum flooring for your own examination. You will see that the deep rich colors go all the way through to the heavy burlap back. "All the way through" means a tough yet resilient thickness composed of materials noted for their wear-resisting qualities—cork, oxidized linseed oil, and burlap.

You will also see a smooth, polished surface that offers not a single lodging place for dirt. This surface is stain-proof. It is moisture-proof. Heels can't bruise it. Walking feet won't scratch and track it.

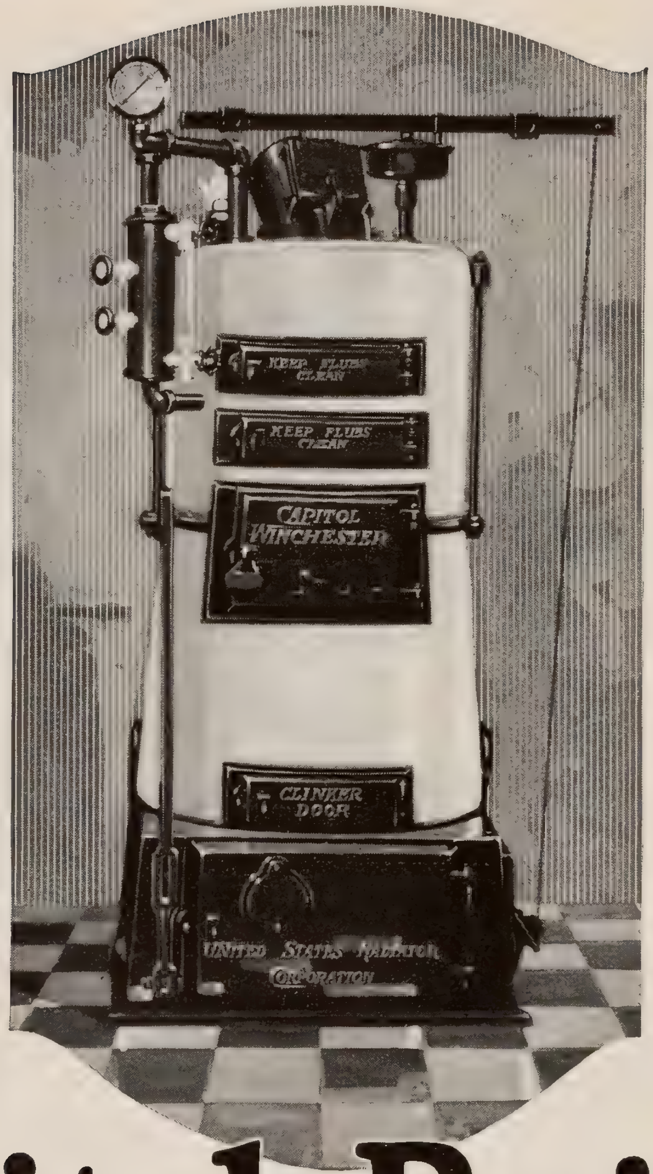
We will also gladly send you colorplates of the new floor patterns, together with information as to the laying and care of linoleum.

Look for the CIRCLE A *trade-mark on the burlap back*

A

Armstrong Cork Company
Linoleum Division **Lancaster, Penna.**

Armstrong's Linoleum *for every floor in the house*



Capitol Boilers

The specification of Capitol Boilers and United States Radiators has always been sound practice.

It is now very *popular* practice because a great national advertising campaign is carrying the Capitol story to millions of homes.

As we have said before we want you to regard this campaign as yours—quite as well as our own.

And, above all, please remember that when you specify our products you can count upon us to assume our full share of the responsibility.

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Superior Graphite Paint—for the prevention of rust.
Sta-White—Interior white paint that stays white.
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Building Paints in all colors.
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See Sweet's Catalogue for specification data.

Offices and warehouse stocks in all principal cities

The Architect's Conception of Lighting Detail

Proper treatment of lighting detail so affects architectural style that it is not surprising to find the architect highly critical of the lighting fixtures to be installed.

If he insists on Smyser-Royer Lamp Posts, Lanterns and Brackets in his specifications it is simply thoughtful protection of the ultimate beauty of the completed building.

You will find a Lamp Post, Lantern or Bracket to fit every need for any style or period of architecture in the Smyser-Royer catalog "H." This book is gladly sent to recognized architects on request.

LAMP POSTS—LANTERNS—BRACKETS

SMYSER-ROYER COMPANY

Exterior Lighting Fixtures

Main Office and Works, York, Pa.

Philadelphia Office, 1609 Sansom Street

MODERN VENTILATION

FOR USE IN—
- Clubs
- Banks
- Theatres
- Hospitals
- Apartments
- Nurses' Homes
- School Buildings
- Commercial Buildings
- — and others

Modern buildings demand modern ventilating methods. The necessity of full, natural ventilation in every room has always been appreciated by the architect. He also knows that the old-style wooden or glass transom is unsightly, that it does not allow privacy, and that it is not thief-proof or fire-proof.

These troubles are entirely eliminated by the VENTILOUVRE—a scientifically constructed device permitting of full, natural ventilation. It is thief-proof, fire-proof, and muffles sound. Beauty is retained in a room or corridor, as its installation permits of an even door height throughout—and it costs less to install than the objectionable old-style transom.

Request folder A2 for your files. It gives complete specifications—and proof of Ventilouvre's worthiness in any type building.

Our representative will call at your convenience.

THE VENTILOUVRE COMPANY

Representatives in Principal Cities

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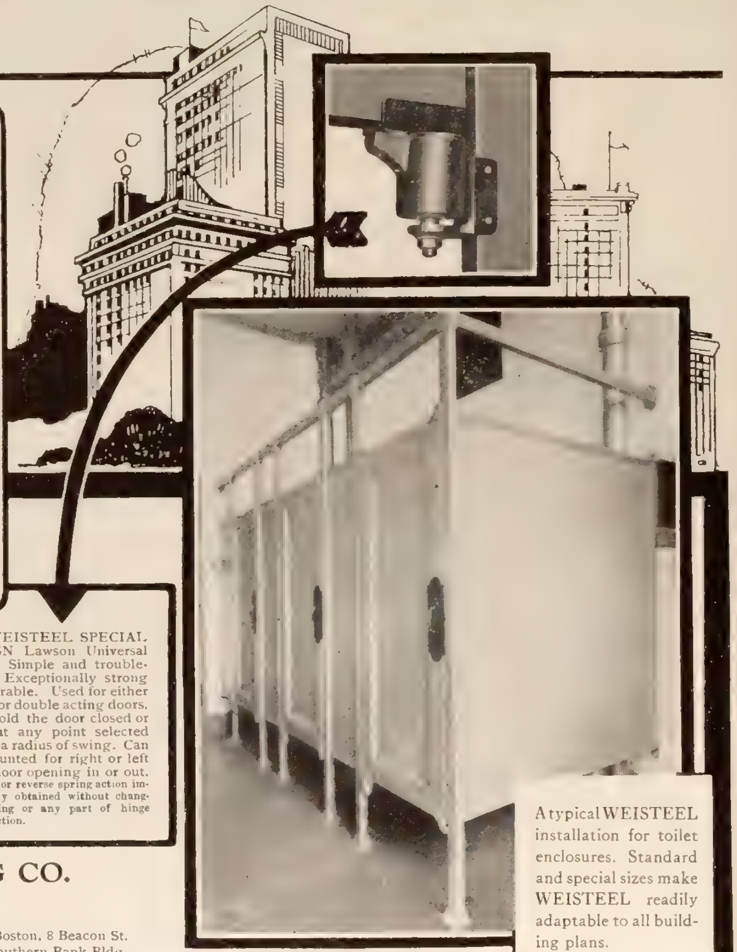
No other steel compartments for toilets, showers and dressing rooms have ever equalled the specifications of WEISTEEL Compartments



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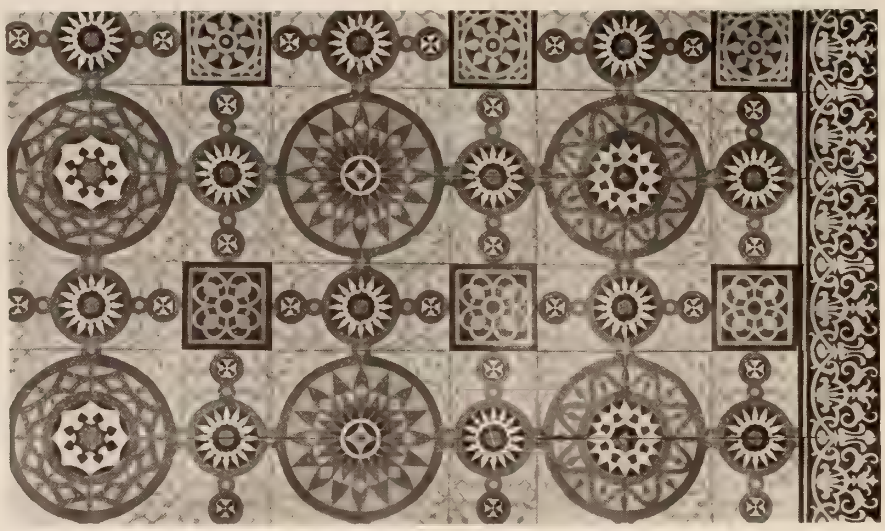

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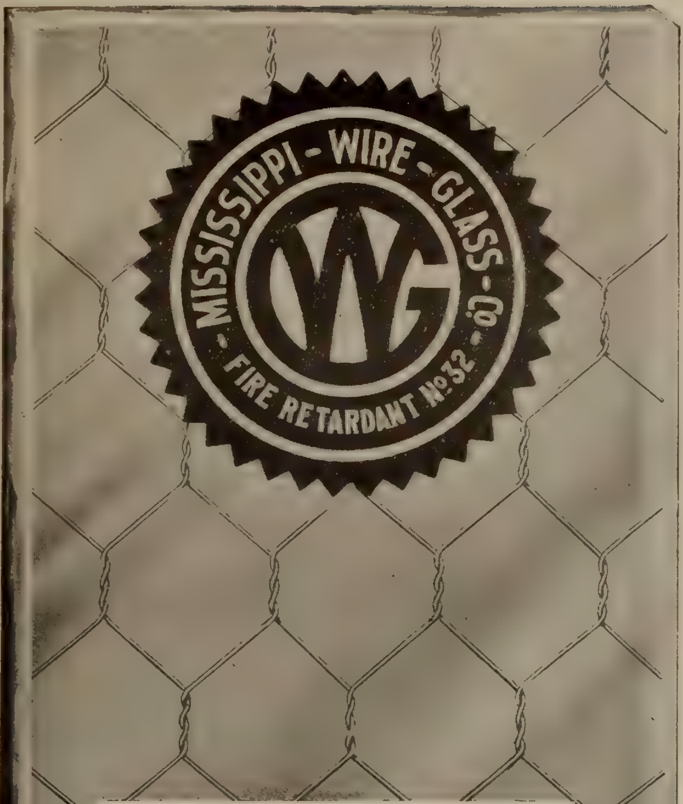

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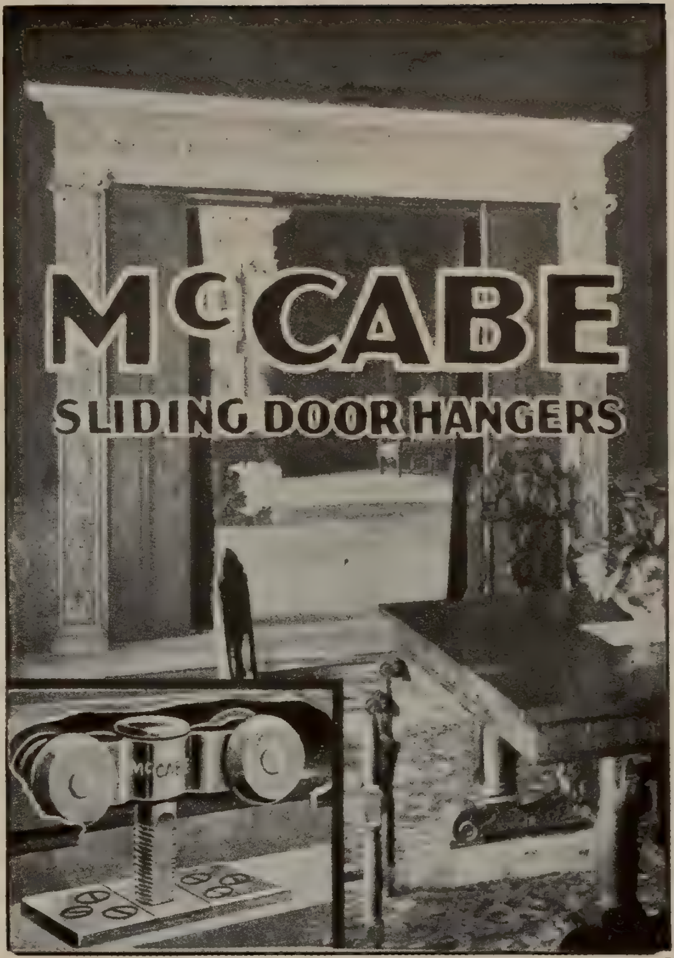

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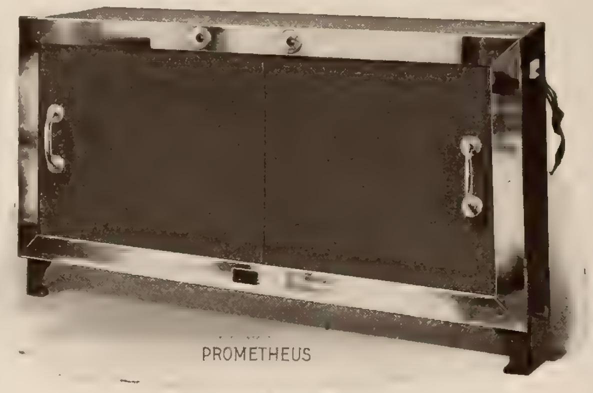

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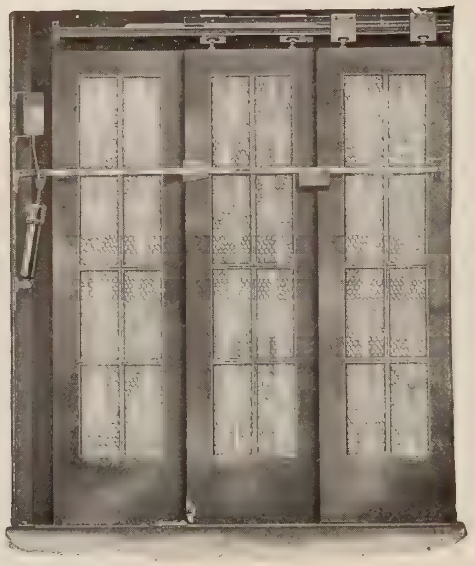

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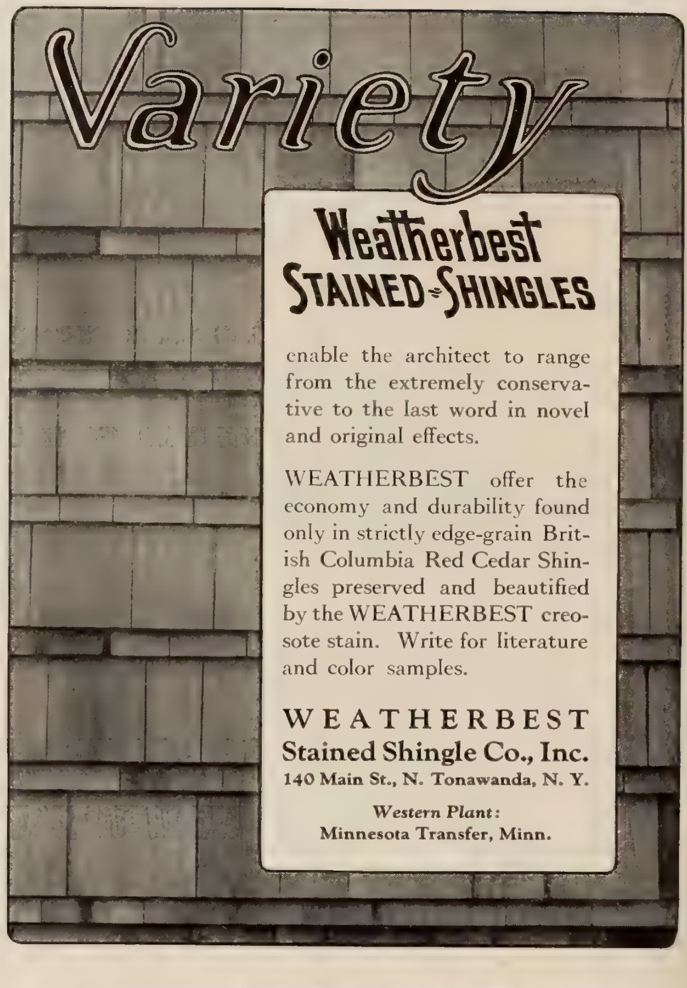

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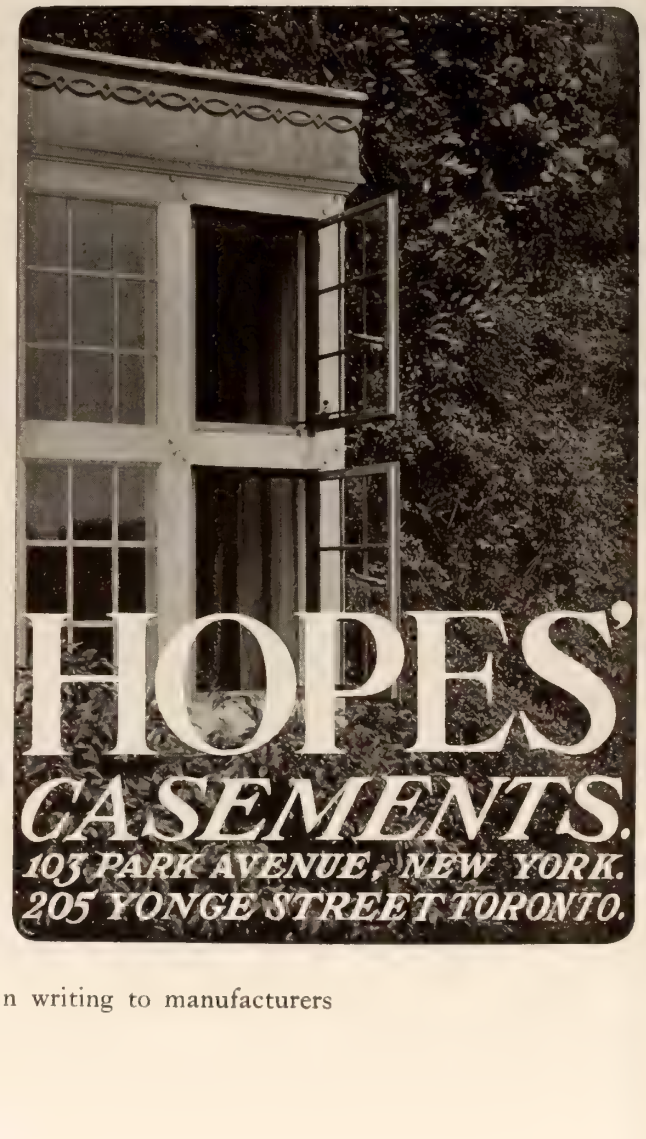

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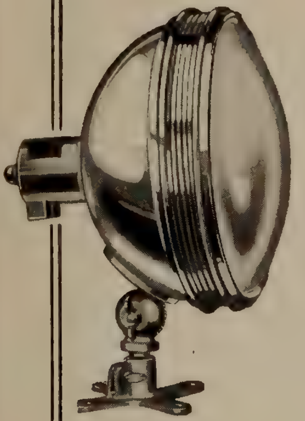

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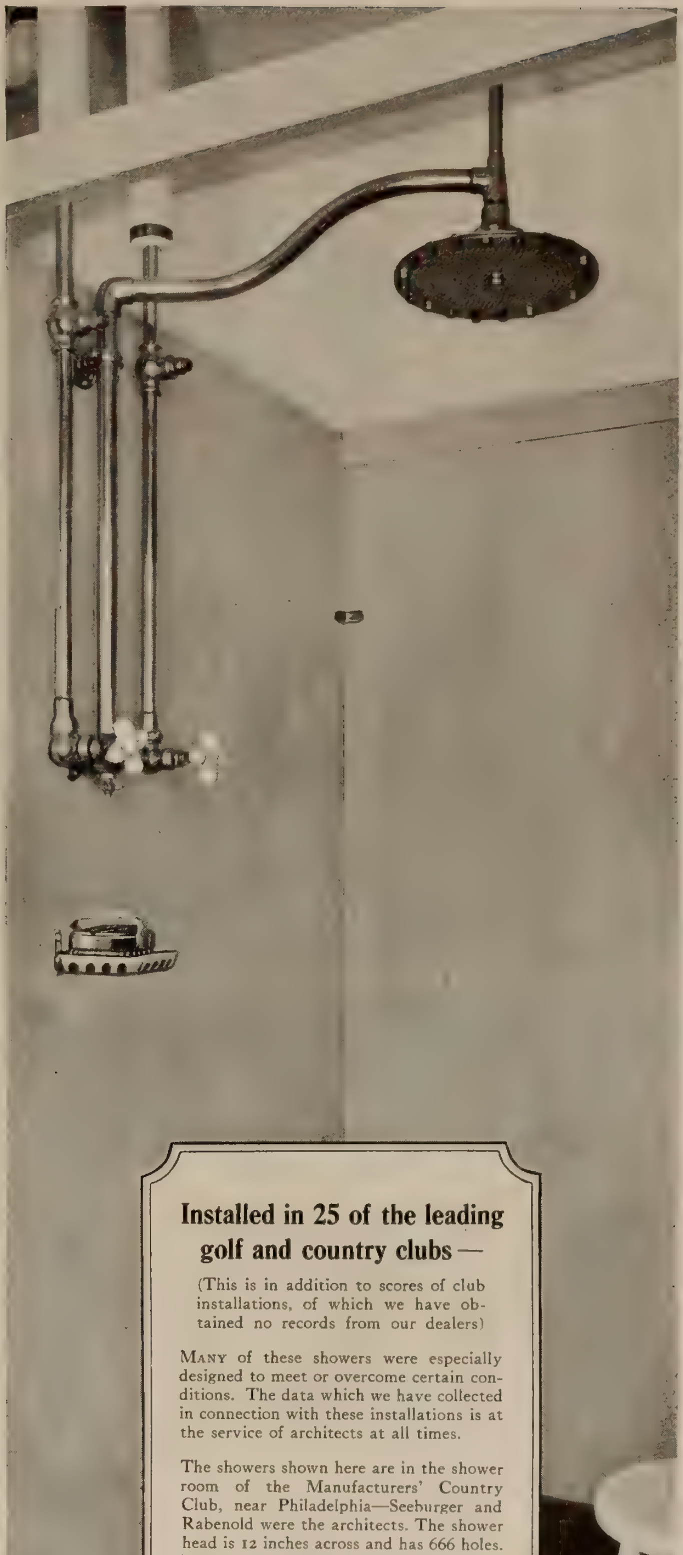

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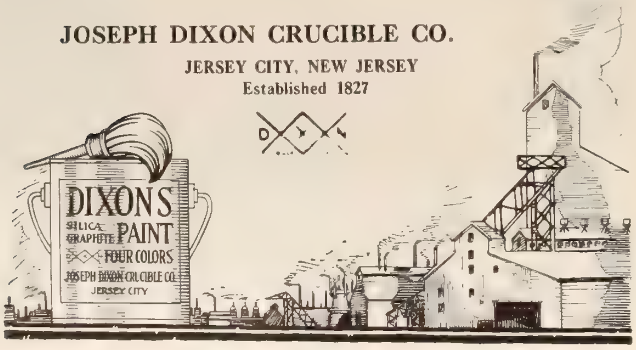

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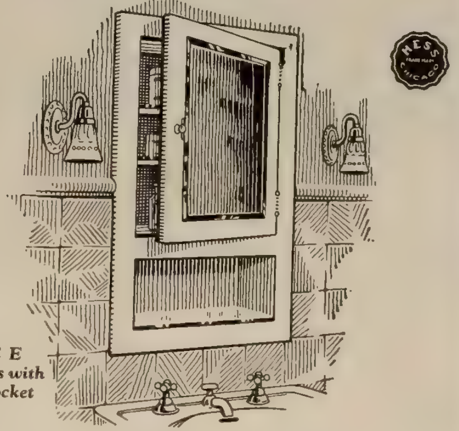

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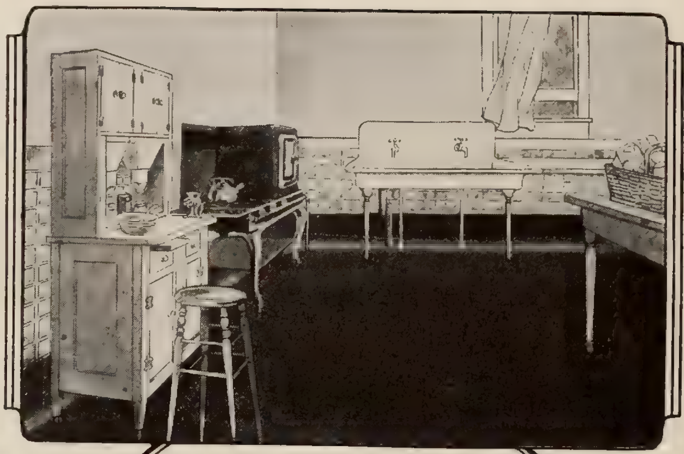

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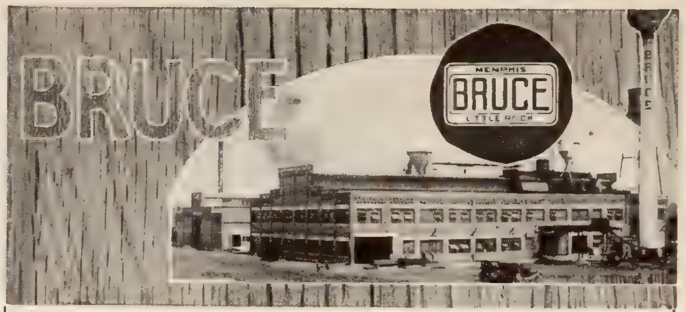

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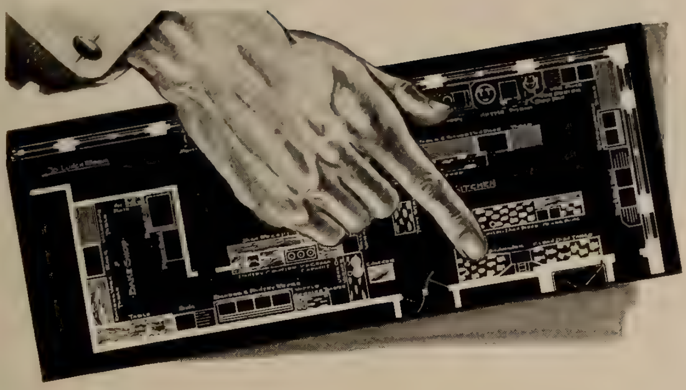

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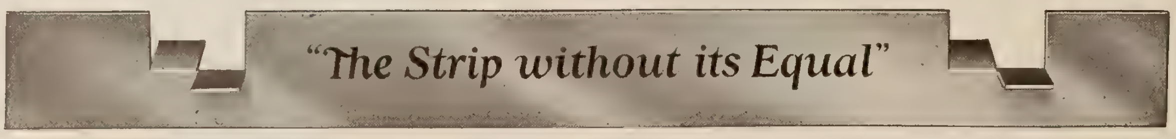

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Fig. 157

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Fig. 367

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Edwards Metal Roofings made in various styles, to have the appearance of wood shingles, tile, slate, or any other roofing effect, and none of these fine artistic effects will cost any more than a plain, commonplace roof.

All Edwards Metal Roofing is easy to lay—no big expense for skilled labor—storms and winds will not wrench it loose or make it a rattle-trap. It is lightning-proof and fire-proof—Reduces Insurance Rates.

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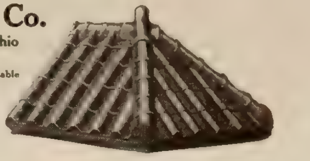
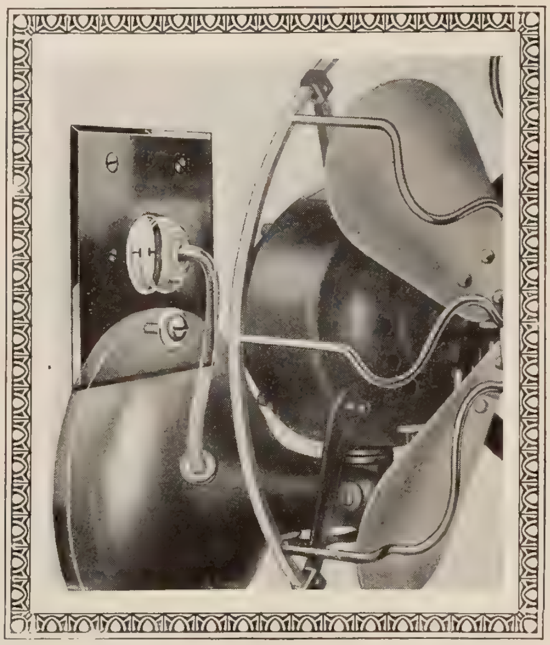
The Edwards Mfg. Co.

824-874 Eggleston Ave., Cincinnati, Ohio

The World's Largest Manufacturers of
Metal Roofing, Metal Ceilings, Metal Garages, Portable Buildings, Rolling Steel Doors, etc.





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The mark of a good job is the manner in which the small details are handled. Electric fans, for instance, should be provided for in the original wiring plan and FA Fan Hangers for both current supply and fan support serve the purpose dependably and at minimum cost. When not in use they are neat and unobtrusive.

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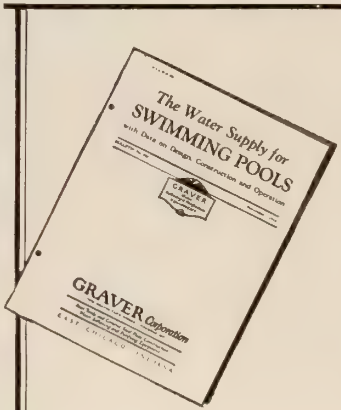

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Water Softening and Purifying Equipment

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Satisfactory results from the installation of Hand Power Elevators and Dumb Waiters depend upon three essentials:

1. Quality of Outfit in design, material and workmanship.
2. Proper installation.
3. The selection of the outfit best adapted to individual conditions and requirements.

You can secure satisfactory results by:

1. Ordering Sedgwick Outfits.
2. (*a*) Having Sedgwick Machine Works make installations, or
   (*b*) Following blue prints and directions furnished by us.
3. Giving us full details and letting us give you the benefit of our advice, based on thirty years' experience as specialists in the design, manufacture, and installation of satisfactory Hand Power Elevators and Dumb Waiters for all purposes.

Because the profit in any sale is of less importance than the opportunity afforded by the transaction to make of the purchaser a permanent customer and friend—

We are less interested in merely selling Elevators and Dumb Waiters than we are in furnishing in each instance that particular outfit best adapted to the conditions and requirements.

Therefore in ordering or requesting estimates please fill in Form No. 136, which we will furnish on request.

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ROYAL
ROUND SECTIONAL and SMOKELESS BOILERS
HART AND CROUSE

The LITTLE BUILDING is *Royal* Equipped

SEVEN years ago, under the direction of Architects Blackall, Clapp and Whittemore and Isaac Coffin Company, Heating Engineers, five S-551 ROYAL Down Draft Smokeless Water Tube Boilers were installed in the Little Building, Boston, Mass.

Inquiry proves that never more than three boilers have been called upon at any one time to serve the 38,000 sq. ft. of direct radiation.

During this period of seven years ROYAL Boilers have enabled the owners to take advantage of the fuel market, and—utilizing oil or coal—the highest degree of efficiency with economy has been obtained.

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HART & CROUSE COMPANY
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*Warehouse in connection

Kernerator-equipped residence of Stanley Goldman, Cecil Place and University Lane, St. Louis, Mo. Architects Study & Farrar; Builder John Craig.

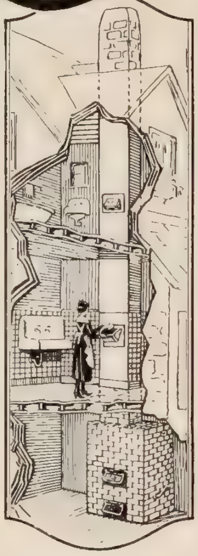
Architects Study & Farrar Create for Contentment

BEAUTY of line and form must grow hand-in-hand with *liveability* in the homes planned by Study & Farrar of St. Louis.

Hence the time-tried Kernerator, which banishes the garbage nuisance for all time, and achieves a new neatness of house and yard, is almost a standard specification in work from the boards of this well known firm.

No Upkeep Cost— No Fuel Used

As shown, the Kernerator consists of a brick combustion chamber at the base of the regular chimney, with a separate flue, having hopper doors conveniently located in or near the kitchens above. *All* waste—garbage, sweepings, tin cans, bottles, papers, magazines—trash of every sort—is dropped through the hopper door, then forgotten. An occasional lighting burns everything but non-combustibles, which are flame-sterilized for removal with the ashes.



Here is a typical Kernerator installation. It costs no more than a good radio set, and gets rid of the garbage nuisance forever.

For additional data, consult Sweet's (1924) Pages 2536-37, or write

KERNER INCINERATOR COMPANY
1011 Chestnut Street Milwaukee, Wis.

KERNERATOR
Built-in-the-Chimney
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Drop all waste here *—then FORGET it!*

Even the Simplest Home Should Have Frigidaire

ANY home, however simple and inexpensive, can easily afford the great convenience of Frigidaire Electric Refrigeration, for Frigidaire can be purchased for as little as $190 f. o. b. Dayton.

There are complete cabinet models of Frigidaire, or the owner's present ice-box may be converted into a Frigidaire electric refrigerator at a very reasonable cost.

In any case, the specification of Frigidaire permits the architect to design the kitchen or pantry for greatest possible working convenience, and without regard to outside ice supply. Often this saves more than enough in building cost to pay for Frigidaire.

The Frigidaire Architectural Competition

We are now conducting a competition for the design of model kitchens equipped with Frigidaire. Prizes range from $500 to $25. All architects, designers, draftsmen and students are invited to enter. Application should be made to the Professional Advisor, Mr. H. J. Williams, care of Schenck and Williams, Architects, Mutual Home Bldg. Dayton, Ohio.

Requests for general information about Frigidaire should be sent to

DELCO-LIGHT COMPANY
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Frigidaire
Made by the World's Largest Manufacturers of Electric Refrigerators

Lake Shore Power House, The Cleveland Electric Illuminating Co., Cleveland, Ohio

THE POWER PLANT

RACKLE Artstone is often specified for the sills, arches, cornice, coping, etc., of power houses, on account of its solid and enduring character. Then the question of cost always enters into the construction of such buildings, and here the economy of Rackle Artstone shows to advantage. Made for over fifty years. Catalogue sent on request.

The Geo. Rackle & Sons Co.
Cleveland :: Ohio
Established 1870

GR ARTSTONE SC

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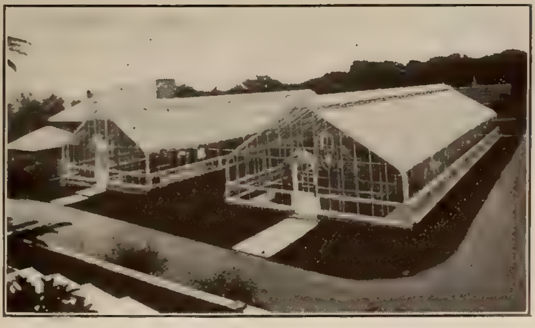
Quality Greenhouses

Why We Say "ASK A LUTTON OWNER"

Because he knows:

- *How strong and beautiful his Lutton V-BAR greenhouse is*
- *How it lets in more sunshine*
- *How cost of repairs is practically nil*
- *How extraordinarily productive it is*
- *How V-BAR construction prevents dripping from condensation*
- *How glass, imbedded in cypress cushion, will not break from expansion or contraction*
- *How his greenhouse is perfectly ventilated, scientifically heated, and easily and economically maintained*



V-BAR Greenhouses built for Moses Taylor, Esq.
"Glen Farm," Newport, R. I.

These prominent men are Lutton owners: Richard Delafield, Tuxedo, N. Y.; Carll Tucker, Mount Kisco, N. Y.; R. K. LeBlond, Cincinnati, Ohio.

These well-known architects specify the Lutton V-BAR Quality Greenhouse: Walker & Gillette; McKim, Mead & White; Bowen Bancroft Smith; Mills, Rhines, Bellman & Nordhoff; Peabody, Wilson & Brown.

Our cooperation—plans, suggestions, and specifications—yours for the asking.

BVR TRADE MARK REG. U.S. PAT. OFF. GREEN HOUSES PAT. JAN. 2, 1917

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Progress Picture—Lawyers' Club and Dormitory Building
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Manufacturers of Steel Structures of all classes

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WARDS OF THE STATE

are receiving greater consideration than ever before and matters of sanitation and the insuring of health are deemed of the greatest importance, not alone for the welfare of the individual but in preventing contagion for the benefit of all.

The above illustration shows a small part of the South Colony State Hospital buildings at Central Islip, N. Y., which extend continuously 1¼ miles, every building being "GLOBE" ventilated as shown above.

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can be relied upon to furnish complete, continuous ventilation with absolute elimination of trouble or upkeep expense. Strongly constructed of heavy rust-resisting material, they will give many years of satisfactory service.

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Consult with Art Metal on Doors and Trim.

ARCHITECTS are urged to avail themselves of our vast fund of experience and engineering skill in the designing and production of architectural hollow metal.

Art Metal steel doors, trim and partitions are found in many of America's finest office and bank buildings. All have been produced by the intelligent co-operation of Art Metal with architects.

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Write for further information, detail drawings or estimates

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Steel and Bronze Equipment for Banks
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Coney Island's New Hotel

The Hockenbury Hotel Financing Service For Architects

HERE is another example of the financial cooperation which this organization affords the architect.

Coney Island, N. Y., needed a modern hotel costing $2,400,000 for its world-famed Boardwalk. Geo. B. Post & Sons, the well-known architects, were consulted and plans were prepared but it rested with the Hockenbury organization to dispose of the junior securities, without which no hotel would have been built.

Similar cooperative efforts have been successfully employed in nearly 100 other cities wherein modern hotels were needed.

THE HOTEL FINANCIALIST, a monthly journal devoted to the subject of community hotel finance, has been of assistance to other architects in bringing similar prospects down to earth. May we send it to you, gratis? Ask us to place your name on our complimentary architectural list "T-7."

The Hockenbury System Inc.
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The WHITE HOUSE Line

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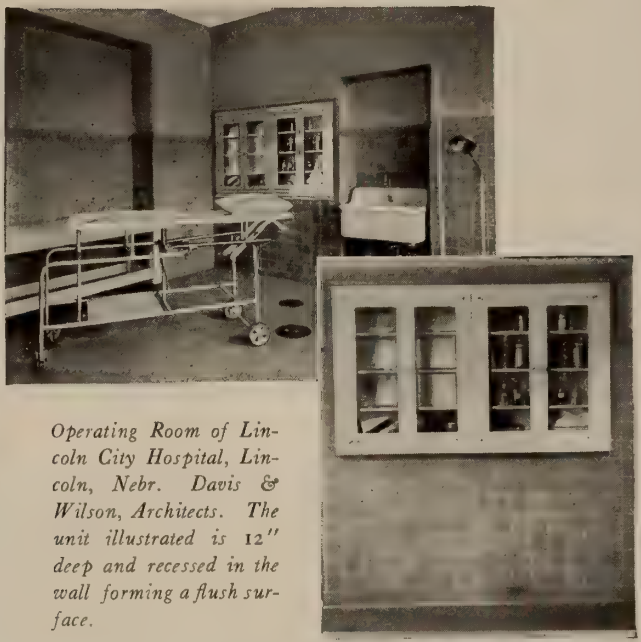

Operating Room of Lincoln City Hospital, Lincoln, Nebr. Davis & Wilson, Architects. The unit illustrated is 12" deep and recessed in the wall forming a flush surface.

The Modern Hospital Requires Steel Units

FROM Operating Room to Kitchen, the modern hospital is fully equipped with Steel Units. Old fashioned wooden cabinets, cupboards and closets are things of the past.

WHITE HOUSE Units are fire-proof, moisture-proof, vermin-proof and absolutely sanitary. They fulfil the exacting needs of hospitals where unusual durability and sanitation are essential. They are all standard units—no special work is required in making or installing them. Catalogue upon request.

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Electrically-welded
RAILINGS and GATES

A railing of strength and distinction

Remarkably strong — because each picket is electrically-welded to the rails at sixteen points.

Distinctive — because of simple, clean-cut lines, unmarred by braces, lugs or rivets.

While simplicity is the outstanding quality of Anchor Railings, the architect is not limited in his choice of decorative details. The increased strength resulting from electric-welding gives him wider scope in developing his design.

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ANCHOR *Fences*

Kinnear Motor Operated Steel Rolling Doors in Factory, American Insulation Co., Philadelphia, Pa.

Unfailing Satisfaction

Because of the perfect balance and alignment, the operation of KINNEAR Rolling Doors is always a satisfaction. They are always ready—always easy to open or close—giving an unfailing service that is invaluable to industrial establishments of all kinds.

They may be operated by hand, mechanically, or by motor. This makes them adaptable to buildings of all sizes. Kinnear Doors are really a part of a building—each door being built especially to fit in with the building plan.

Kinnear Fire Doors bearing the Underwriters Label are recognized by architects as the standard by which all other doors are judged. They are trustworthy under all conditions.

We maintain branches in the leading centers—thus securing for you the maximum efficiency at all times.

Our Engineering Department is at your service for consultation on special problems of installation. Write for illustrated booklet.

The Kinnear Manufacturing Company
660-670 Field Ave., Columbus, Ohio

AGLITE
TRADE MARK REGISTERED
PATENT APPLIED FOR

Porcelain Enamel Units

This

with no screws visible and a permanent porcelain enamel finish

or

This

with dust catching screws and crevices. Finish easily tarnished.

BEFORE YOU SPECIFY

fixtures for kitchens, bathrooms, nurseries, or hospitals consider the unusual merits of Aglite Porcelain Enamel Units.

First off, there is Aglite construction. Shade and bracket are tightly joined by a patented concealed screw collar, instantly adjusted. Installed, Aglite presents a smooth, glistening, white surface of permanent porcelain enamel, guaranteed never to tarnish, check or peel. Aglites may be thoroughly cleaned in three seconds with a damp cloth. No screws or metal parts are visible. And each unit is perfectly insulated.

Installation may be made direct to house wires in five minutes, and Aglite's clean, white beauty and the abundance of soft glareless light it sheds, will win instantly the approval of your clients.

If you will compare the Aglite porcelain enamel unit above with the old style fixture shown opposite, there'll be no doubt in your mind as to which unit to specify. There's an Aglite type for every need.

Shall we send you a copy of our new catalog? No obligation whatever.

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Make your school toilet compartments sanitary.

In fairness to the health and morals of the children, nothing less is justifiable.

Make them strong.

Otherwise the children will make them rattle-traps.

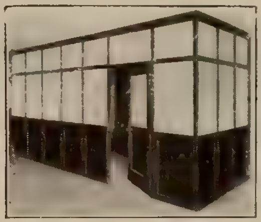
Make them good-looking.

No toilet *has* to be ugly.

Make them economical.

But be sure you make them economical *in the long run.*

Make them Sanymetal!



Sanymetal Products are: Partitions for toilets, showers, dressing rooms, urinals. Partitions for offices and factories. Metal doors, screens and wainscot. Sanymetal Gravity Roller Hinges for toilet doors. Write for latest Bulletins.

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JACKSON
BRONZE
WINDOWS

Designed with utmost skill and built with an accuracy formerly thought needless in a window, Jackson Windows of solid bronze have demonstrated, through twenty years' practical use, their enduring character.

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Architect

London Guarantee Trust
Building of Chicago
completely pointed
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VULCATEX

VULCATEX
An elastic, everlasting cement forming a perfect bond between all structural materials. It never hardens. Always stays tight. Its use is a part of standard specification of National Terra Cotta Association.

DEHYDRATINES
Are thoroughly dependable liquid or plastic compounds for every water-proofing, damp-proofing and stain-proofing need. We suit the method to conditions and the material to the method.

HYDRATITE
Water-proofs concrete and cement mortars integrally and permanently. Used in mortar joints—stucco—foundations and floors.

A. C. Horn Company, LONG ISLAND CITY, N. Y.
38 Horn Building

Competition for Designs of Ornamental Iron Work

Open to all architects, draftsmen, designers, architectural students and workers in iron

Class

A: Ornamental Iron Work for Small Dwelling costing $25,000 or less.

B: Ornamental Iron Work for Apartment Building.

C: Ornamental Iron Work for Office Building.

Prizes	*Class* A	B	C
1st	$100	$100	$100
2nd	50	50	50
3rd	25	25	25
4th—Three	10	10	10

Purpose:

To encourage the use of ornamental iron work in various types of buildings; to bring before the architects designs adaptable to standard specifications; to further cause ornamental iron workers to resort to methods of standardization tending towards more economical production.

Judges:

Jury of award will consist of two leading architects, two ornamental iron workers and one representative of this firm. The names of the judges are: Dwight James Baum, New York, Frank H. Quinby, New York, Samuel Yellin, Philadelphia, W. M. Buchroeder, Richmond, Va., and C. Weiler, of J. G. Braun, New York.

Basis of Judgment:

Judgment will be rendered by the jury upon:

Originality of design.
Practicability of design.
Beauty of design.
Execution of drawing.

Subject:

No restrictions are placed on the type of design other than it be an integral part of the building, such as stairs, railings, grills, balconies, window boxes, elevator doors and fronts, etc. Interior decorative items such as lamps, fixtures, andirons, tables, etc., are not eligible.

Material:

Any material, such as rolled, or hammered iron or steel, cast iron, non-ferreous metals, steel mouldings, tubing, pickets, drop forged ornaments, the latter items taken from J. G. Braun catalogs 17, 18 and 22, may be used.

Any design to be eligible must show the use of one or more steel mouldings selected from J. G. Braun catalogs 17 or 22. Excellence of the effects produced will be considered rather than the quantity of mouldings used. Catalogs will be made available upon request to those not having access to them.

Drawings:

The drawings must be executed on white paper in black ink. There is no restriction as to scale used or number or size of sheets submitted for any one entry.

Contestants may compete in all three classes but may not submit more than one design for any one class. State clearly on each drawing in which class it is entered.

The drawings are to show a sketch of the ornamental iron work in its surrounding conditions, a detail view and plan and sectional view. Scale must be easily readable and be stated on drawing. The catalog number or numbers must appear on the sheet.

An identification mark or nom de plume must be placed on each drawing which must be accompanied by a sealed plain envelope containing a true copy of identification mark or nom de plume together with the competitor's name, address and name and address of employer, if any.

The right is reserved to possession of all drawings receiving prizes. All other drawings remain the property of the contestant.

The right is reserved by J. G. Braun to publish or exhibit all drawings as they deem fit. Name and address of the contestant will be given in such publications.

Time:

The contest will close October 1st, 1925, noon, and awards will be made shortly after the close of the competition.

J. G. Braun will use care in handling and returning the sketches but the contestants submitting them assume all risks of loss or damage to their sketches.

It is understood that the contestants agree to the above conditions and that all decisions of the appointed jury shall be final.

Address all communications to ORNAMENTAL IRON CONTEST, c/o J. G. Braun, 160 Greene St., New York, N. Y.

J. G. BRAUN

CHICAGO—NEW YORK—SAN FRANCISCO

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Struco Slate is Natural Slate with a fine moulded finish—in any color desired.

Struco Slate will not chip, crack or discolor and will outlast the building.

Let us send you actual samples of Struco Slate—every architect should have them. They're yours for the asking.

STRUCTURAL SLATE

Manufactured by

THE STRUCTURAL SLATE COMPANY

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CENTURIES OF SERVICE
PYRAMID
NATURAL SLATE
STRUCTURAL

Armstrong's Cork Tile Floors from Coast to Coast

In the Fairmont Hotel, St. Louis, Mo., the lobby is handsomely floored with Armstrong's Cork Tile. The field of this floor is a 9" x 9" light Cork Tile bordered and panelled with 2" strips of dark shade.

Where East Meets West

SOME OTHER
MID-WESTERN
INSTALLATIONS

- **Federal Reserve Bank, Chicago, Ill.**
- **Federal Reserve Bank, Dallas, Tex.**
- **First National Bank, Laurel, Miss.**
- **Chicago Methodist Temple, Chicago, Ill.**
- **Kansas City Club, Kansas City, Mo.**
- **Gatesworth Apartment Hotel, St. Louis, Mo.**
- **Ford Motor Co., Des Moines, Iowa**
- **John Crerar Library, Chicago, Ill.**
- **Franklin County Court House, Union, Mo.**
- **Archdiocesan Seminary, Area, Ill.**
- **Dillon Read Company, Chicago, Ill.**
- **Luick Ice Cream Co., Milwaukee, Wis.**
- **Belleville Bank & Trust Co., Belleville, Ill.**

As in the East and West, so in the prosperous cities of the Mississippi Valley, Armstrong's Cork Tile is yearly increasing in favor for buildings whose floors must combine distinctive appearance with comfort, quietness and durability. Floors of Armstrong's Cork Tile are found in the best examples of Mid-Western banks, libraries, churches, public halls and offices.

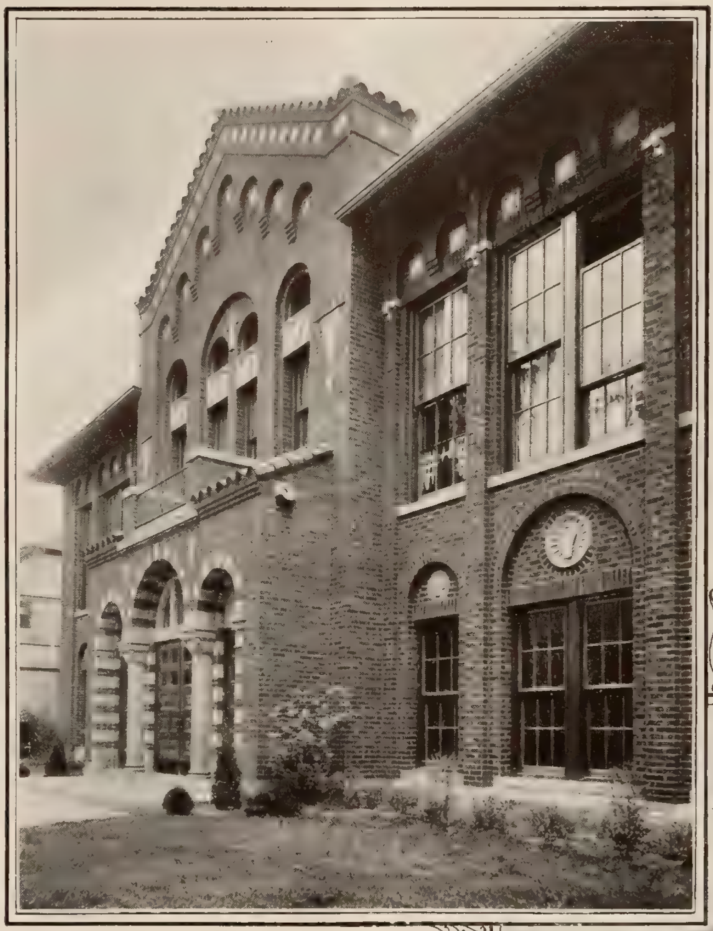
Armstrong's Cork Tile combines the structural advantages of a durable, wear-resisting *floor* with the beauty, resilience and comfort of expensive *coverings*. It is tile, with all the individuality of tile design and the harmony and warmth of color. Yet it is yielding to the tread, as comfortable and silent as a carpet. It is easy to clean, not readily stained or marred, and needs no polishing or waxing. It is sound-absorbing and sound-deadening.

The list at the left is indicative of the wide variety of uses for which Armstrong's Cork Tile floors have gained the unqualified approval of architects, owners and public.

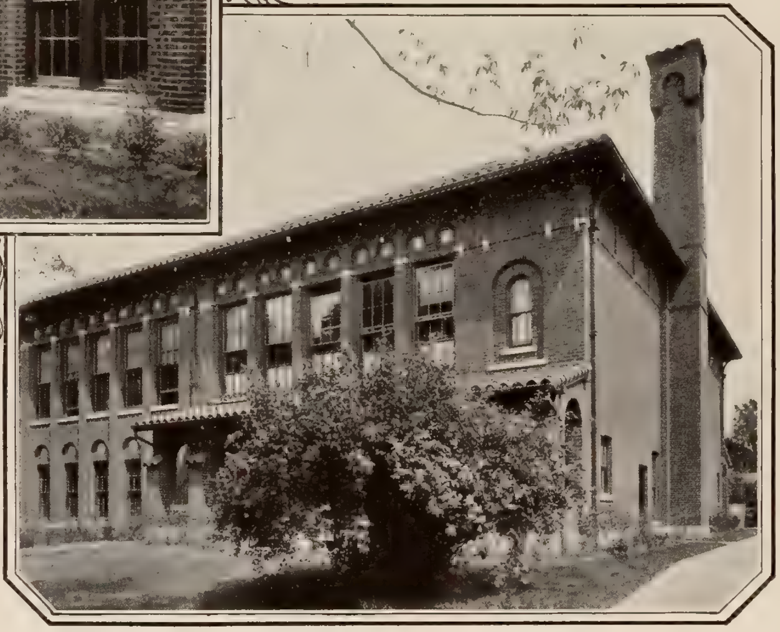
Sample tiles and the book, "Armstrong's Cork Tile Floors," will be sent on request.

ARMSTRONG CORK & INSULATION COMPANY
Division of Armstrong Cork Company
160 TWENTY-FOURTH STREET PITTSBURGH, PA.
Also Manufacturers of Linotile Floors

Armstrong's Cork Tile



A SPLENDID example of brick treatment that carries out the spirit of the material. Note the grace of the piers with their stone caps, the beautiful frieze, lightened with spots of stone trim, the pendant arches, resting on the corbels, and the chimney with its ornamental cap. The soft texture of the wall imparted by the mat brick and natural flush cut mortar joint, which is one of the most charming features of this building, is lost in the small illustrations.

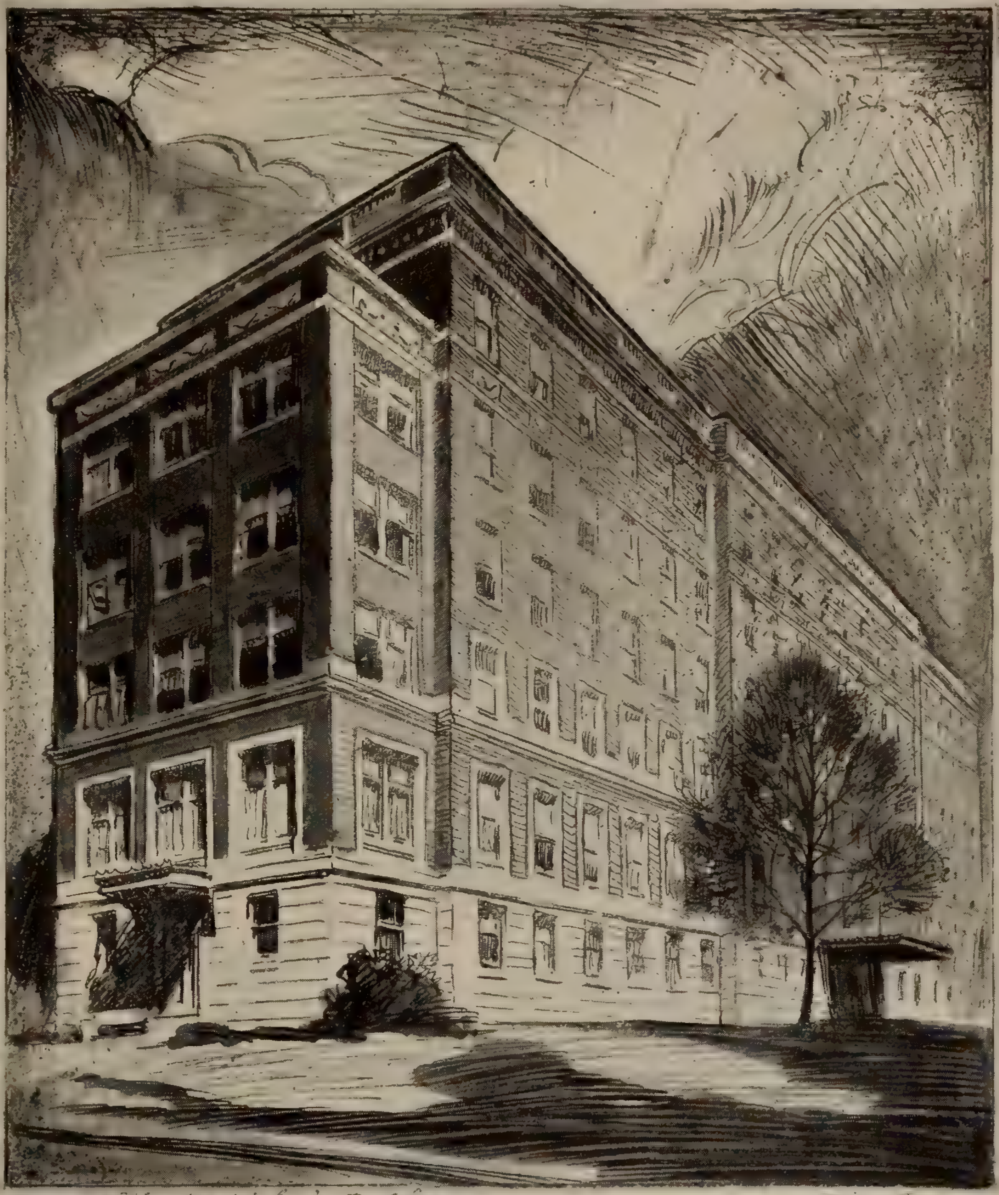


Two Views
of St. Paul's School,
Park Ridge, Illinois.
James Burns, Architect

ARCHITECTS in all parts of the country are designing beautiful face brick buildings. More than a hundred illustrations of their work have been assembled in "Architectural Details in Brickwork." These halftone plates suggest the wide range of effects that can be economically produced by standard size face brick. The portfolio, published in three series, each inclosed in a folder ready for filing, will be sent to any architect making request on his office stationery.

"English Precedent for Modern Brickwork," a 100-page book, beautifully illustrated with halftones and measured drawings of Tudor and Georgian types and American adaptations, sent postpaid for two dollars.

AMERICAN FACE BRICK ASSOCIATION
1753 Peoples Life Building · Chicago, Illinois



Miami Valley Hospital, Dayton, Ohio,
Raetzinger & Musselman / Architects
Max Pinker & Sons, Contractors

BRIXMENT FOR PERFECT MORTAR

The reason why more and more well-known architects are specifying BRIXMENT exclusively is because they know, by experience, that BRIXMENT mortar possesses certain important qualities that cannot be obtained in any other mortar. They know, for instance, that BRIXMENT mortar is a true cement that does not fade mortar colors, resists moisture and combines with these and other desirable qualities the essential of maximum strength. Because of extraordinary plasticity, BRIXMENT mortar spreads faster, more accurately and more economically. Handbook containing details gladly sent you on request.
LOUISVILLE CEMENT COMPANY, *Incorporated*, LOUISVILLE, KENTUCKY

BRIXMENT

Pyrono is real wood on the surface—but a positive fire barrier inside

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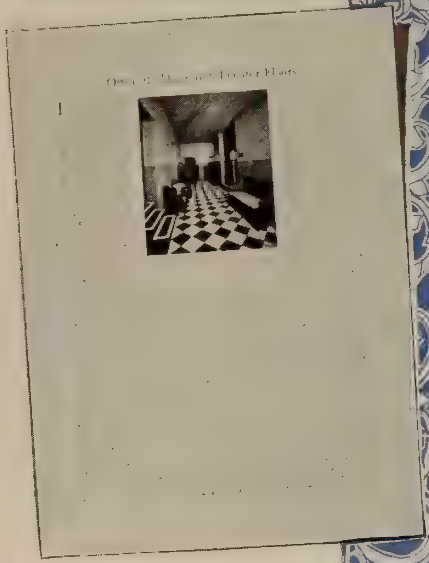

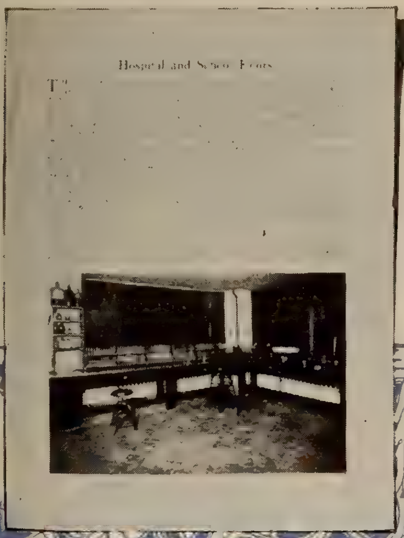

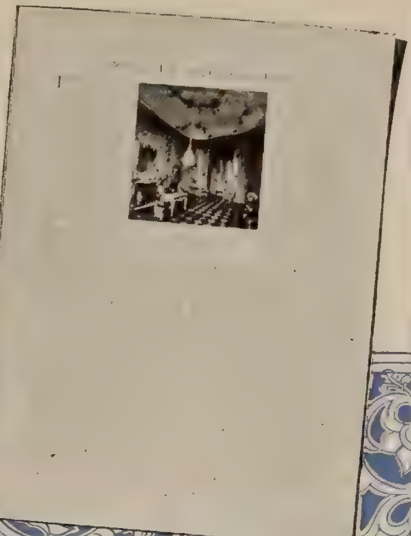

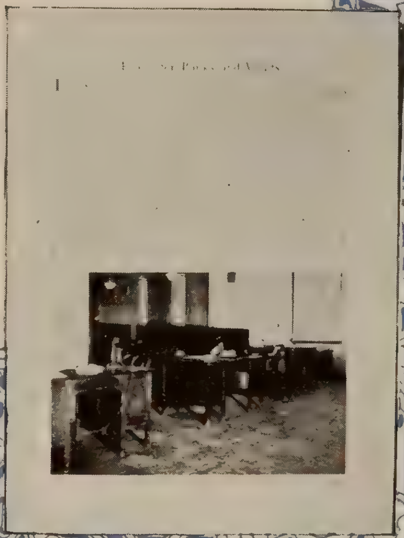

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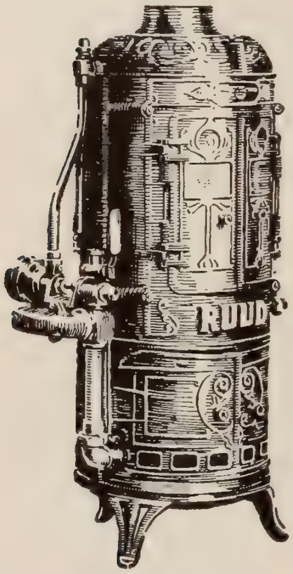

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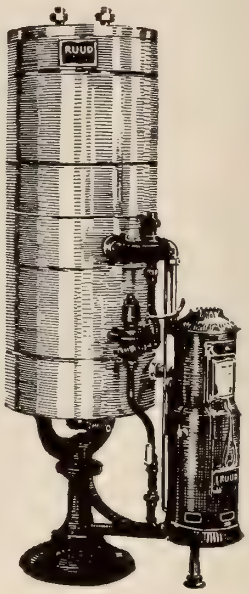

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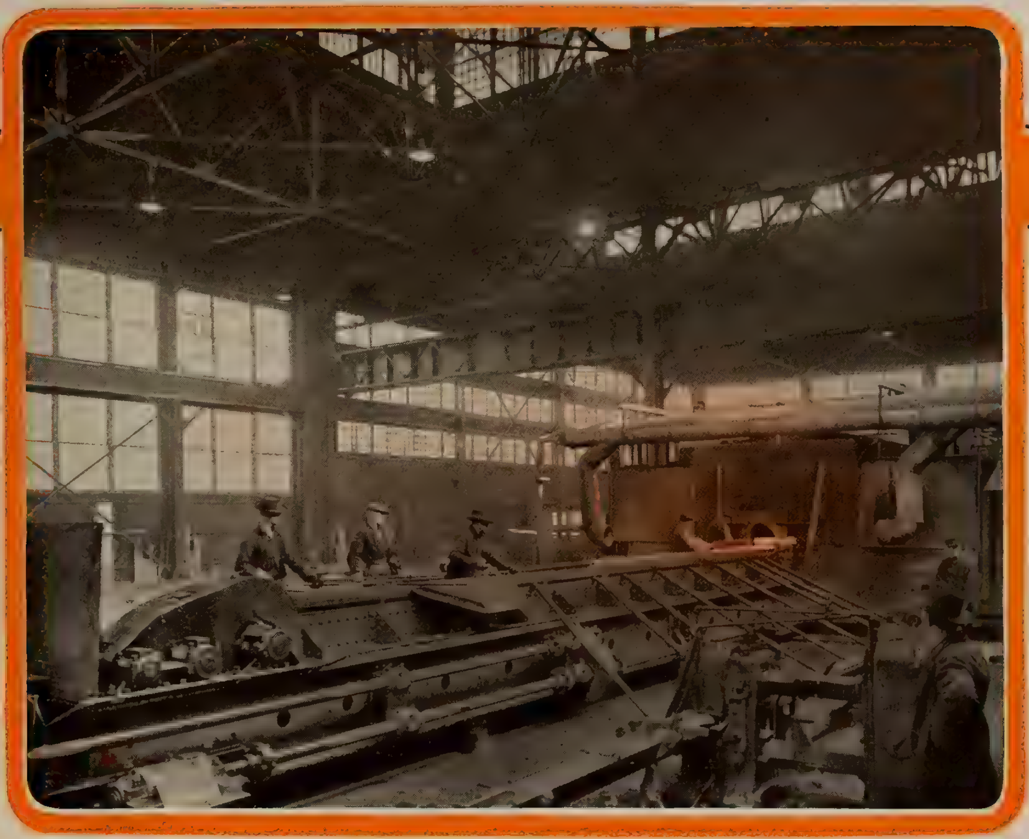

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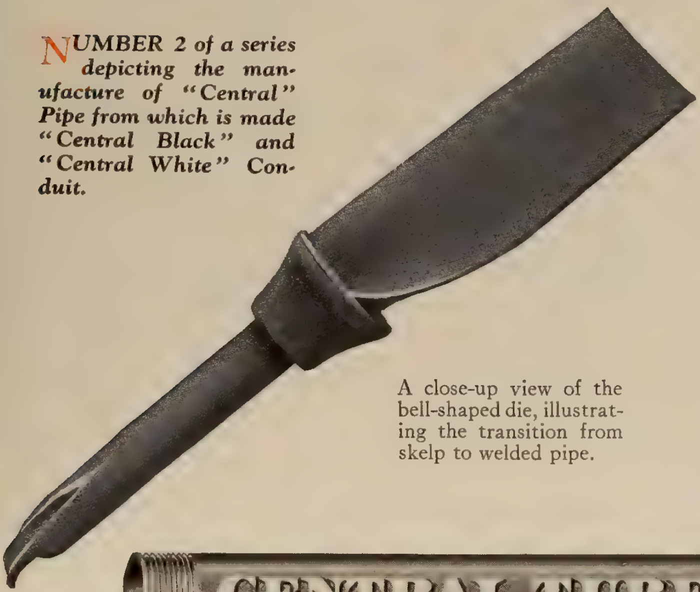

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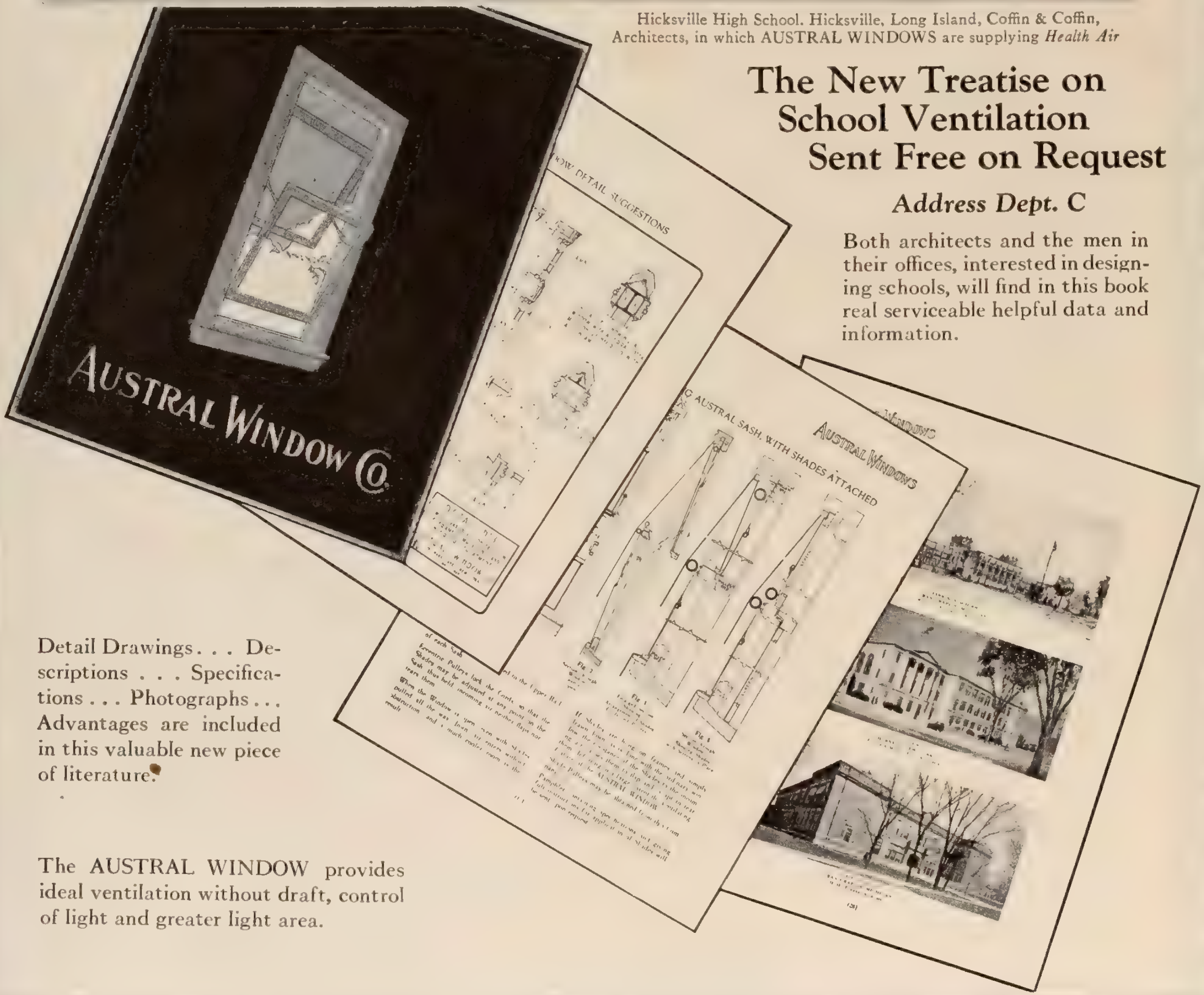

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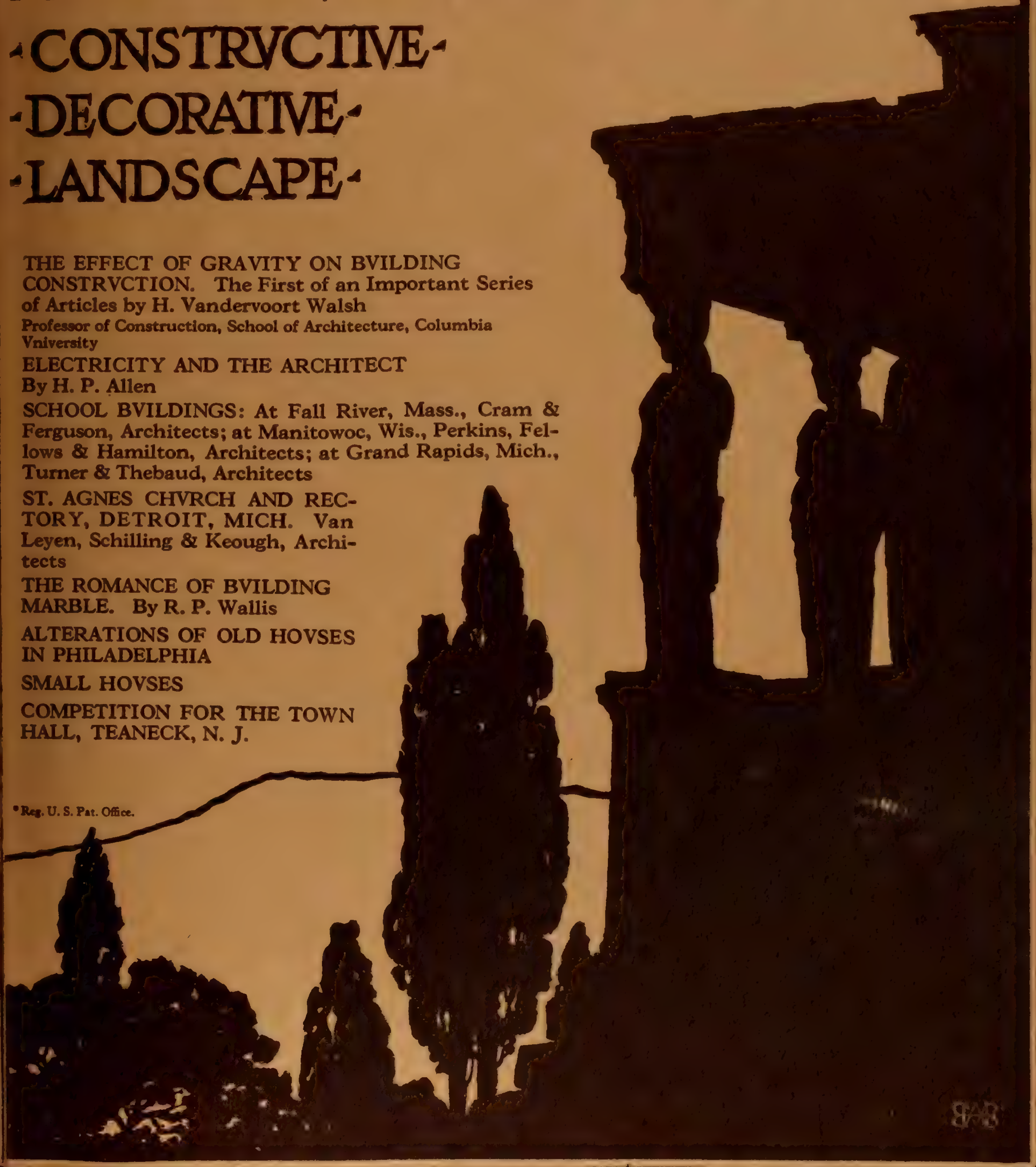

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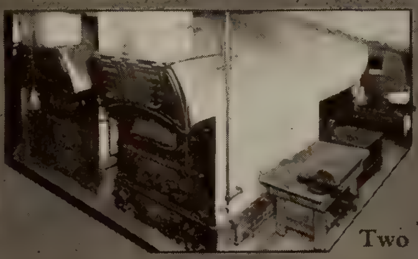

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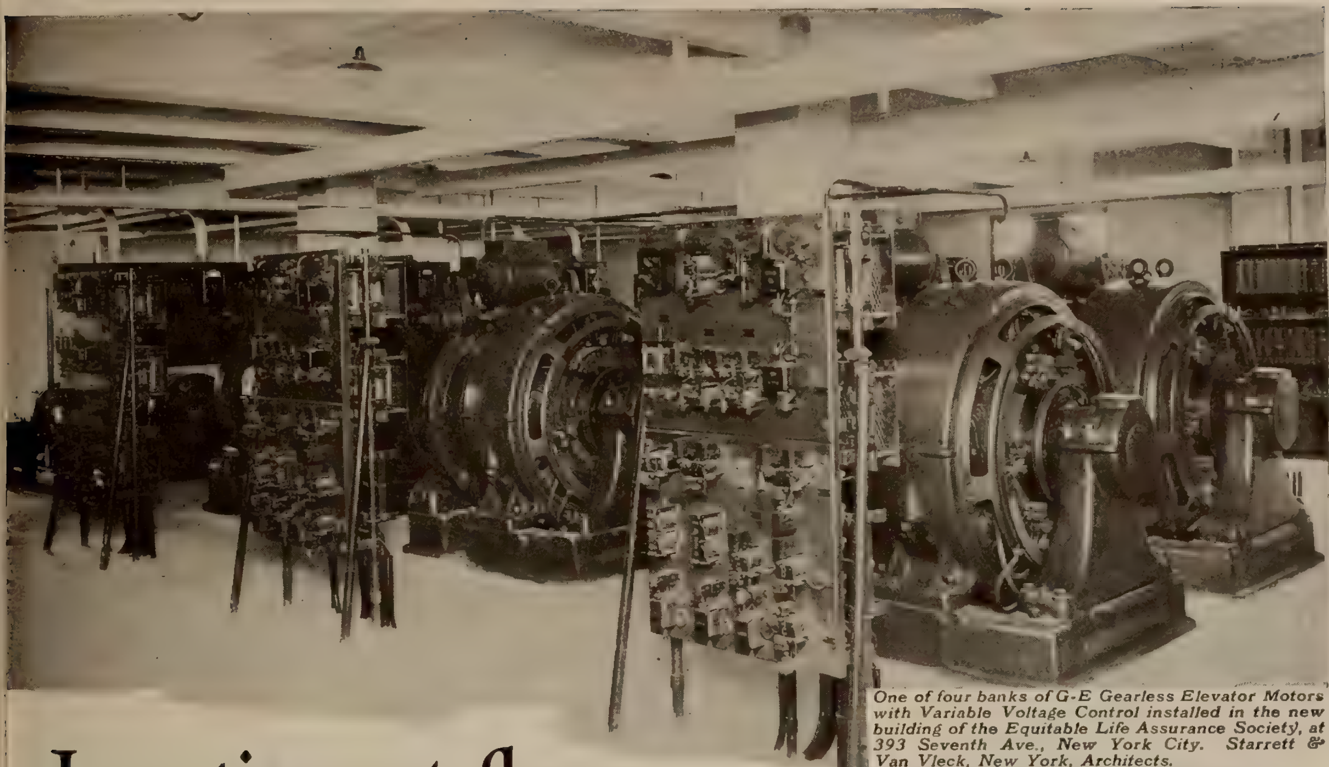

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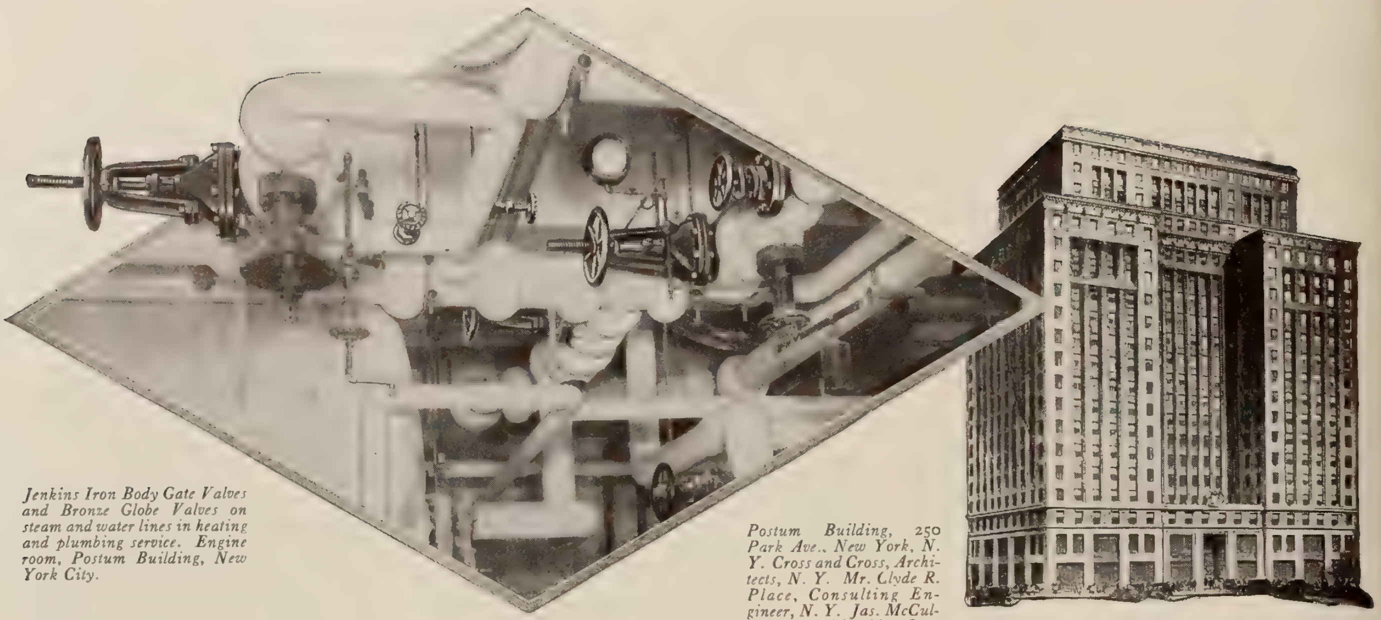

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See the taper? That is one distinguishing feature of the spirally reinforced steel shells into which we pour every Raymond Pile. Each shell is left in the ground, experience having demonstrated the value of the full protection it renders.

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Spanish Motif Best Shown In Hood Roofing Tiles

Everything in present day Florida architecture reflects the charm and atmosphere of old Spain. Hood Roofing Tiles are in eminent vogue because of their true Spanish character.

"Above all things" use Hood Roofing Tiles.

Requests for particulars or quotations cordially serviced.

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True Mission Style
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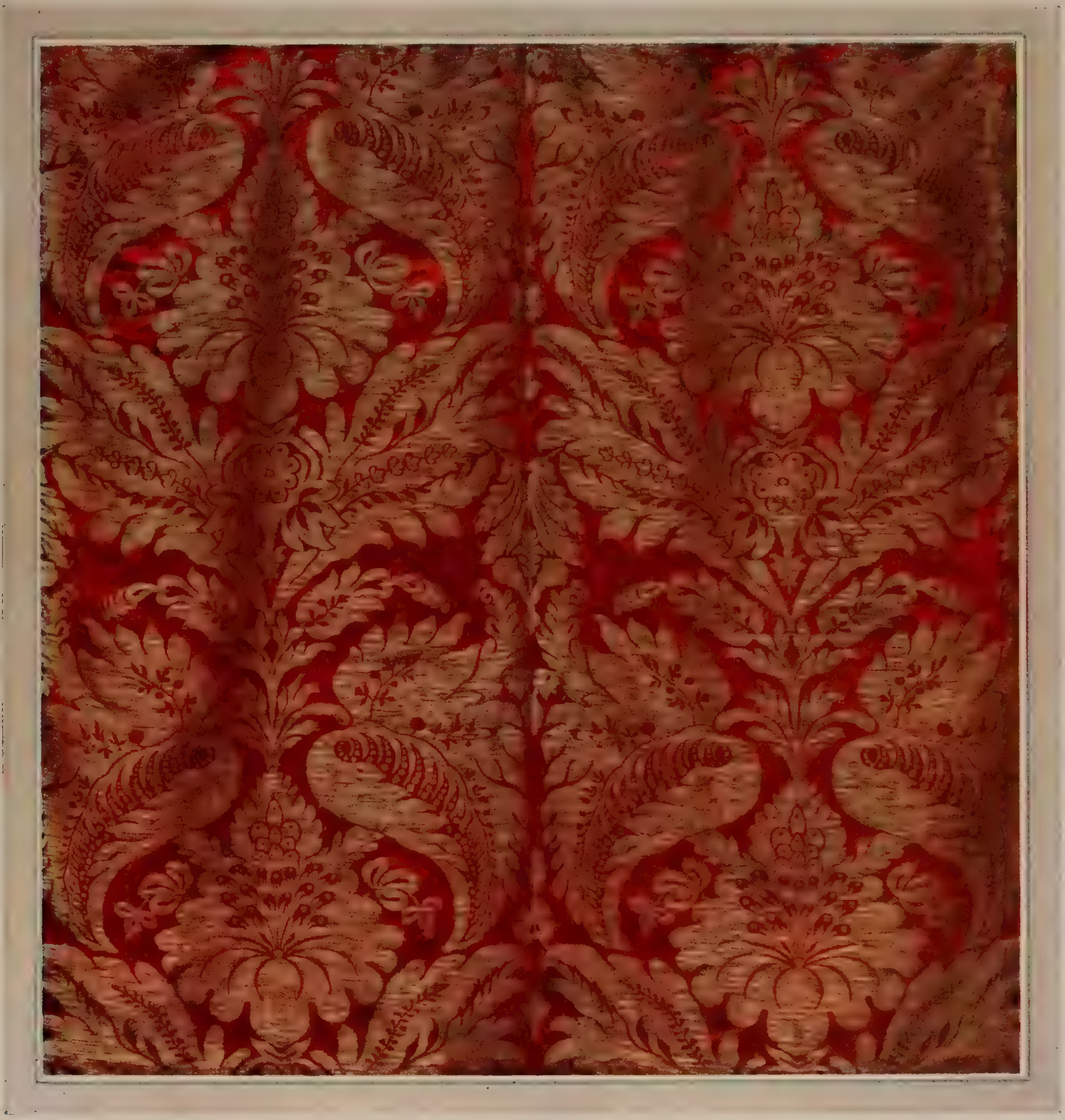
brave in Crimson and Gold

To the grim and stately palaces of Renaissance Italy the forebearers of this damask brought a new loveliness. Then borne on a wave of enthusiasm, they came from Italy to France, where Louis XIV kept splendid court at Versailles.

Faithful to this double inheritance this modern damask shows how sumptuous color was fitly matched by noble sweep of design in those splendid fabrics. Woven on our own looms in this country, it is typical of the fine spirit of Schumacher fabrics which may be seen by arrangement with your upholsterer or decorator, who will also arrange their purchase.

F. Schumacher & Co., Importers, Manufacturers, Distributors to the trade only, of Decorative Drapery and Upholstery Fabrics, 60 W. 40th St., New York City. Offices in Boston, Chicago and Philadelphia.



Some of our fabrics are literal transcriptions of historic masterpieces, others are our designers' adaptations of distinguished originals.

The best traditions of bygone centuries are perpetuated by the skill of our weavers and designers which even simulates with consummate art the gentle beauty of fabrics centuries old.

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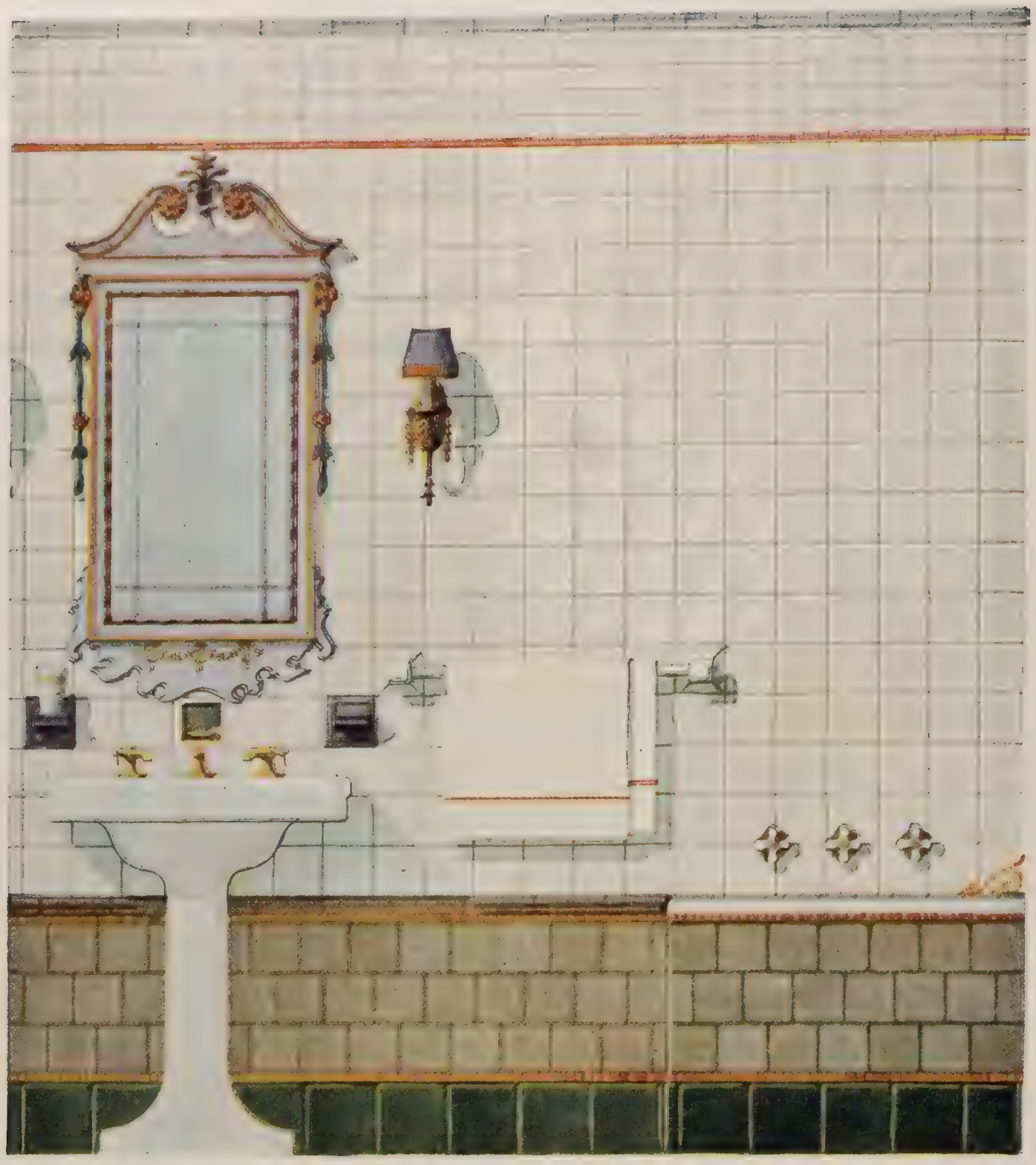
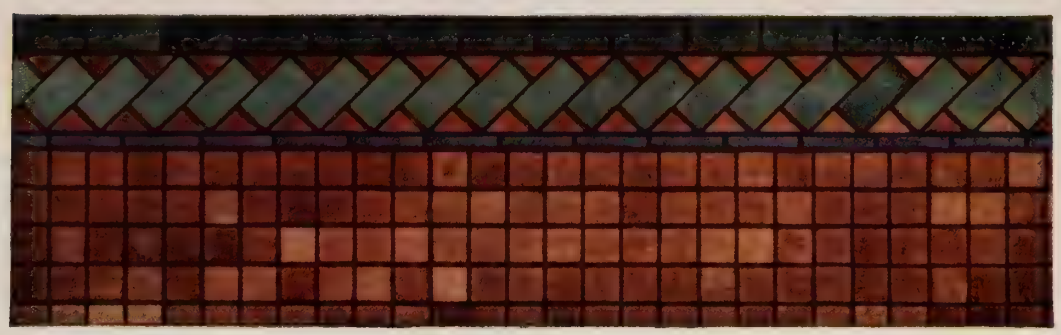


TYPICAL WALL SECTION



SECTION OF FLOOR

Colonial Bath

Standard size plate illustrations in full colors, with detailed description for specifying the tiles of Period Motifs will be forwarded for 8 cents postage. "Beautiful Tiles" booklet free.

This style of period treatment for the modern home is most acceptable in the Bath Room, Kitchen and Dining Room, though it serves well wherever a fine treatment in both design and color is desired.

Period Motifs

This period treatment is based upon accurate historic precedent—developed by authorities in architectural history—and produced exclusively by the Associated factories listed below. Without the correct tiles it is impossible to duplicate this beautiful effect.

ASSOCIATION TILES

assure you of proper reproduction—with all the fine qualities which this original design possesses. Size, color, glaze and texture have been painstakingly selected to insure a correct and artistic result. Motifs for other rooms and other periods are available.

Association Tiles will stay as attractive as originally installed because they do not fade, stain, warp or wear out. On porches and terraces they are absolutely weatherproof.

Associated Tile Manufacturers, 915 Seventh Avenue, Beaver Falls, Pa.

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INTERNATIONAL
AVSTRAL WINDOW

St. Ann's Parochial School
Cleveland Heights, Ohio

George Hunt Ingraham
Architect

IN this new school the question of providing proper light and ventilation without loss of architectural harmony has been solved by the use of International Austral Windows.

The International Austral is not a makeshift, but a window scientifically designed especially for schools, hospitals, offices, banks and other buildings where maximum light and perfect ventilation are essential.

Also manufacturers of the International Casement Window

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The NATION'S BUILDING STONE

THE Tifereth Israel Temple, Cleveland, Ohio, is constructed of Indiana Limestone. This is one of numerous instances during recent years where synagogues, designed in a style derived from the Byzantine which was developed largely in brick, have been built of stone.

For this purpose Indiana Limestone is the most beautiful and durable of all building materials. As in the Tifereth Israel Temple where the stone ashlar is designed in alternate wide and narrow courses, Indiana Limestone affords the architect unlimited opportunities for securing unusual and artistic wall effects.

Write to our Service and Technical Departments in Bedford, Indiana, for aid in any problems you may have in connection with the use of Indiana Limestone.

These booklets sent free, upon request: "The Story of Indiana Limestone"; "Indiana Limestone Bank Buildings"; "Distinctive Houses of Indiana Limestone"; "Indiana Limestone for School and College Buildings"; Portfolio of House Designs.

INDIANA LIMESTONE QUARRYMEN'S ASSOCIATION
Box 771, Bedford, Indiana
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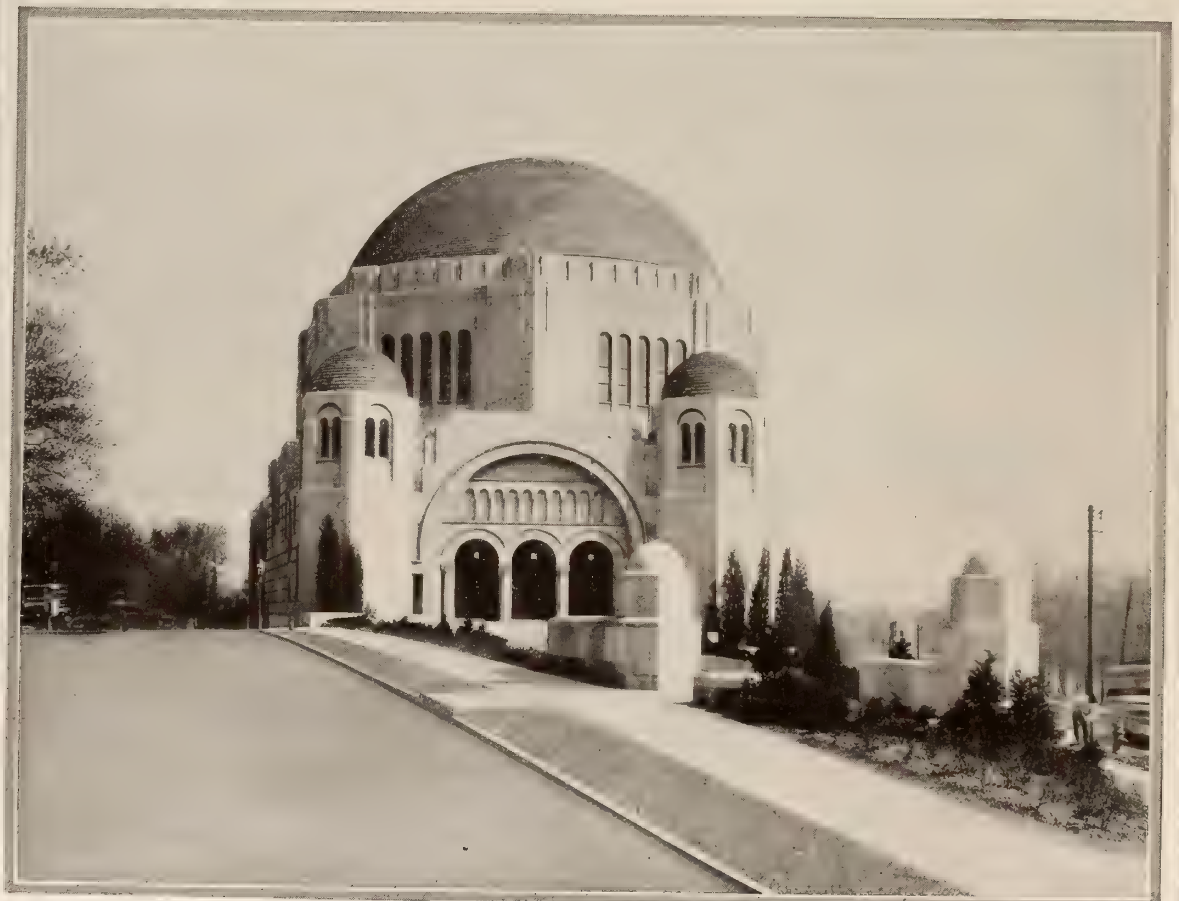
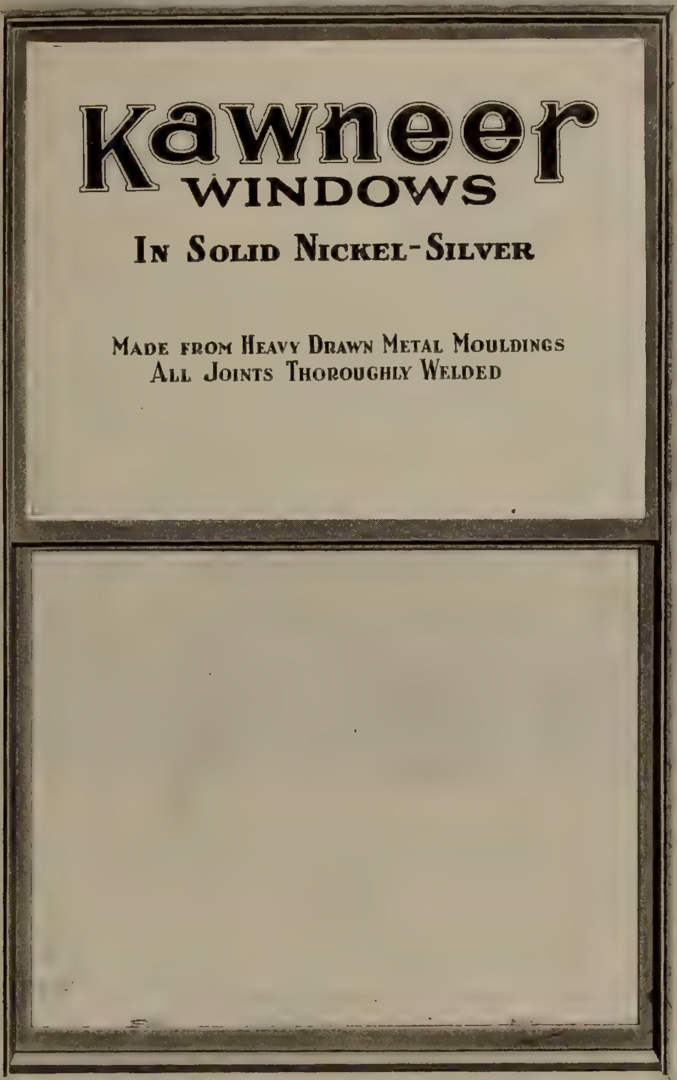
Tifereth Israel Temple, Cleveland, Ohio
Charles R. Greco, Architect





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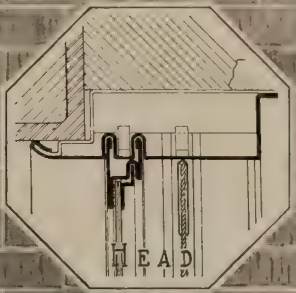

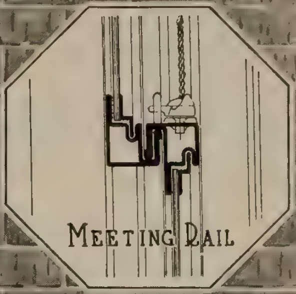

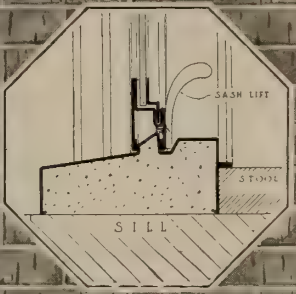

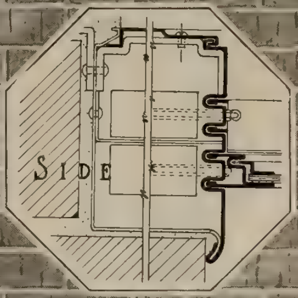

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Kawneer Windows are made of metals that have stood the test of centuries against rust and deterioration.

Sturdy construction gives lasting service and permanent materials assure satisfactory operation with no up-keep cost.

Weight Hung or Casement Types.

Adequate weathering provided by interlocking mouldings for all engaging parts.

Designed and produced by the makers of Kawneer Solid Copper Store Front Construction.

FULL SIZE DETAILS AND MODELS SHOWN UPON REQUEST

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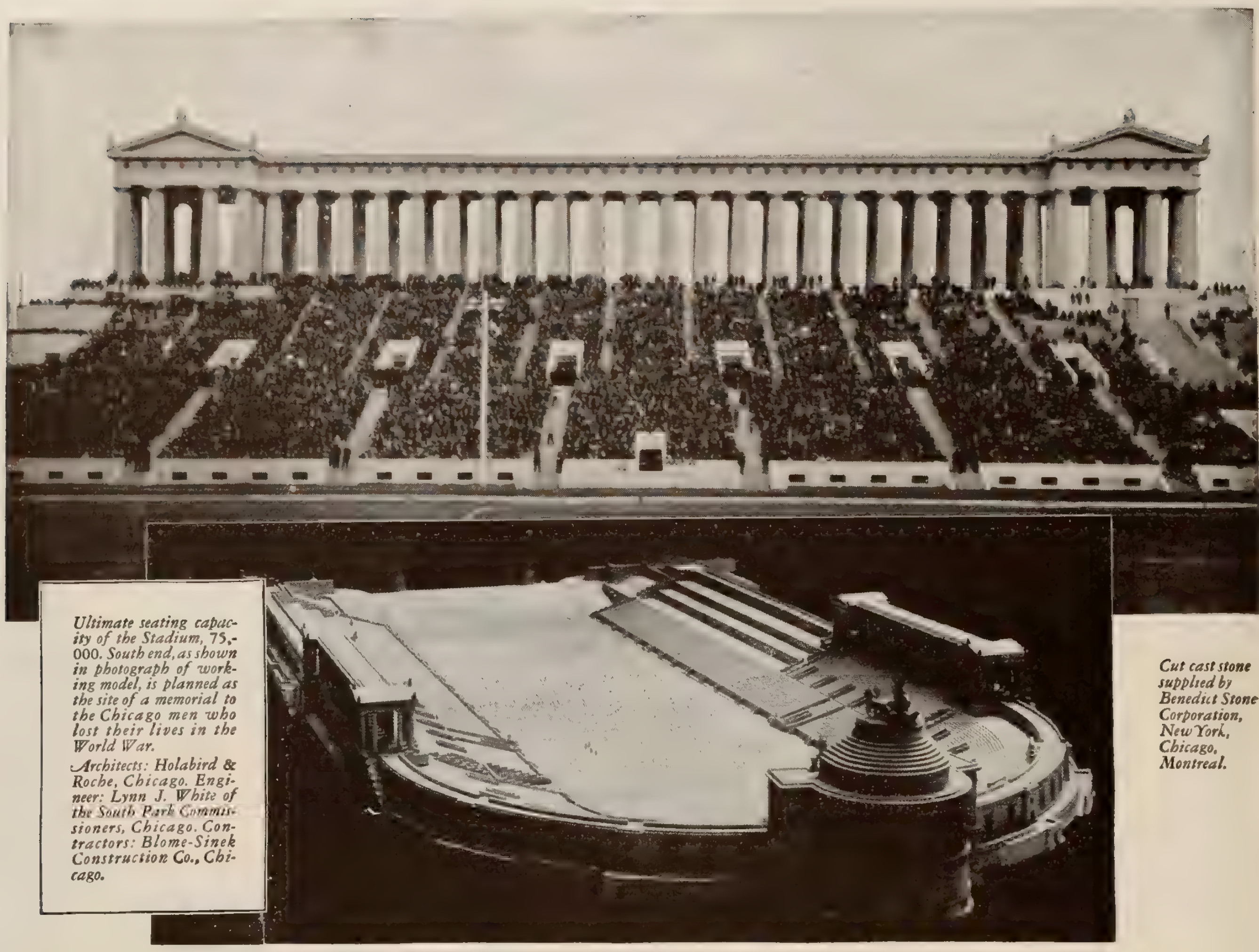

Ultimate seating capacity of the Stadium, 75,000. South end, as shown in photograph of working model, is planned as the site of a memorial to the Chicago men who lost their lives in the World War.

Architects: Holabird & Roche, Chicago. Engineer: Lynn J. White of the South Park Commissioners, Chicago. Contractors: Blome-Sinek Construction Co., Chicago.

Cut cast stone supplied by Benedict Stone Corporation, New York, Chicago, Montreal.

Ancient Greece in Modern Concrete

To those who still believe that the architectural beauty of the ancients can be expressed only in traditional materials, Grant Park Stadium, Chicago, will be a revelation.

This monumental structure takes you back to "the glory that was Greece." And it is done entirely in concrete. This includes the columns and other exterior architectural details, all of which are of cut cast stone. Thus beauty, as well as construction, is made permanent.

Grant Park Stadium is only one of a great variety of structures that impressively demonstrate the wide range of adaptability concrete offers to the architect—a range not within the possibilities of any other material.

* * *

If you are interested in receiving additional data on concrete in stadium construction, address the nearest office listed below. Ask for leaflets S-112 and S-104.

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A National Organization to Improve and Extend the Uses of Concrete

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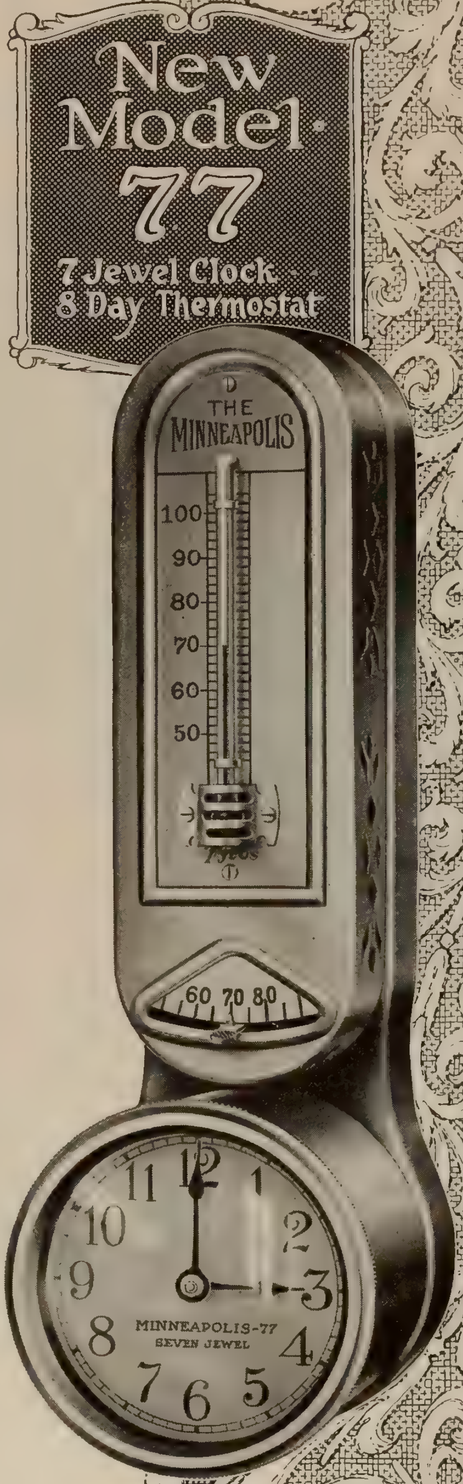

The "MINNEAPOLIS" HEAT REGULATOR

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The New Model 77, with 8-day, 7-jewel clock, assures your clients complete satisfaction. It is the last word in efficiency and dependability in automatic heat regulation.

Our new catalog, fully describing the New Model 77 and the New Electric Motor, just fits your files. Copy mailed on request.

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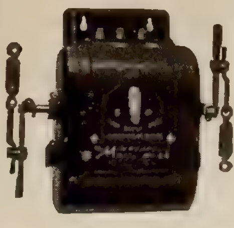
Factory Service Branches in principal cities render complete installation service. Elsewhere specify installation by the heating contractor.

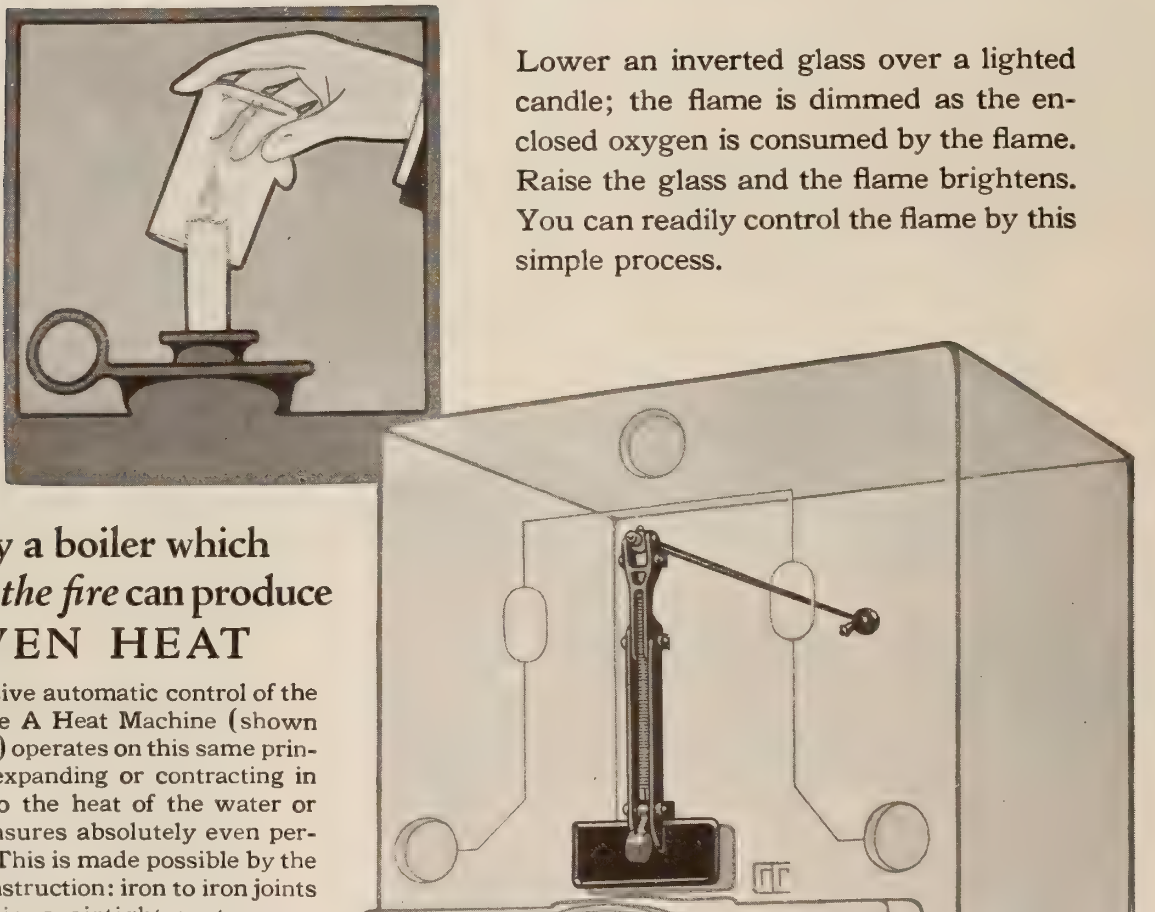
The New Electric Motor



A dependable companion for the New Model 77. Ample power, positive, low-cost operation. Completely enclosed.

Why is the candle dimmed?

Lower an inverted glass over a lighted candle; the flame is dimmed as the enclosed oxygen is consumed by the flame. Raise the glass and the flame brightens. You can readily control the flame by this simple process.



Only a boiler which *controls the fire* can produce EVEN HEAT

The exclusive automatic control of the Ideal Type A Heat Machine (shown at the right) operates on this same principle. By expanding or contracting in response to the heat of the water or steam, it insures absolutely even performance. This is made possible by the airtight construction: iron to iron joints of the sections, airtight, water-surrounded ash-pit, and tight-fitting doors.

No other boilers possess this exclusive equipment. Send to the address below for the new Type A book describing this feature in detail and the many other features of Ideal Type A.

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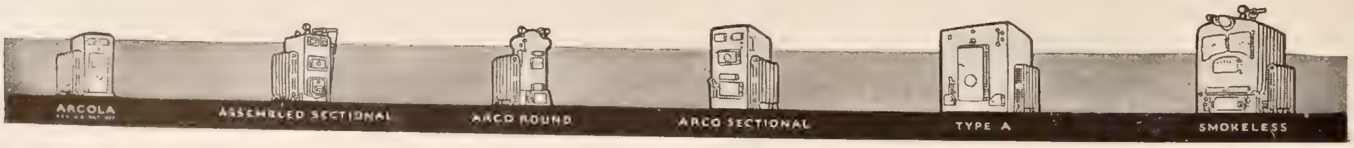

The same qualities that make Horse Head Zinc an excellent material for conductor pipes, eaves-troughs, and gutters make it equally desirable for standing seam roofs.

It is rust-proof, easily laid, free from repairs, inexpensive, good-looking, ever-lasting.

Horse Head Zinc offers to the architect an opportunity to achieve many delightful effects at a surprisingly low cost.

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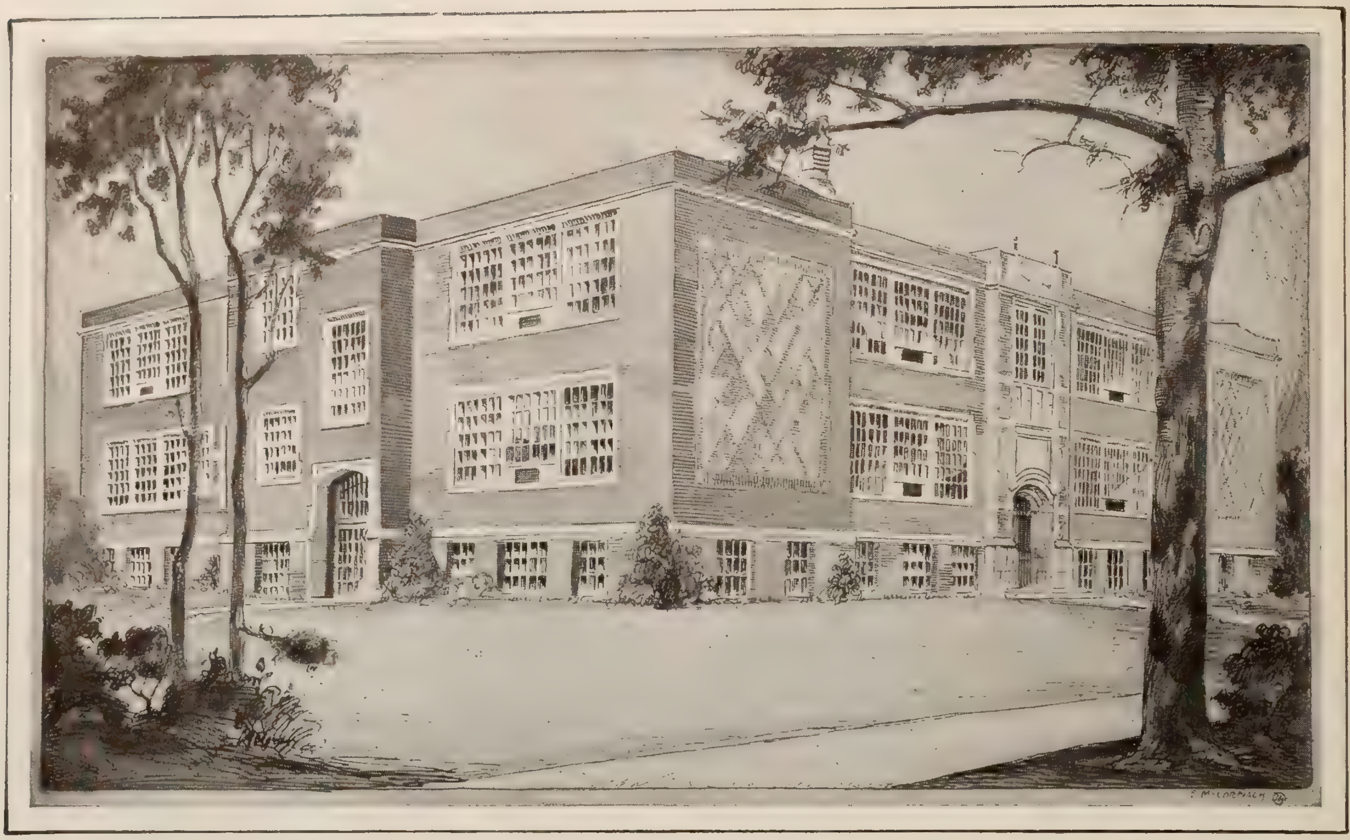
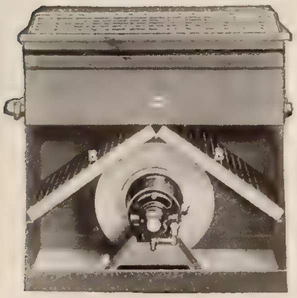


NATHAN HALE SCHOOL, NEW HAVEN, CONN., UNIVENT EQUIPPED. BROWN & VAN BOREN, NEW HAVEN, CONN., *Architects*
D. J. MALONEY, *Chief Engineer, Board of Education*

Architectural Inspiration



Open view of* UNIVENT *illustrating

- *A.*—Copper radiator without a single joint, absolutely leak-proof.
- *B.*—Air filter easily removable for cleaning.
- *C.*—Cone type fan specially insulated for quiet operation.

UNIVENT
(TRADE MARK)
Ventilation

Directly and indirectly the architect has been responsible for much of the world's progress.

His insistent search for mediums that would materialize his plans in greater beauty has resulted in improvement throughout the structural and material trade.

His emphasis of the need for better sanitation and ventilation has resulted in epoch-making improvements.

Inspired and encouraged by architects to perfect the unit system of ventilation, we perfected the Univent. It brings fresh air directly from outdoors to each room, warms it, cleans it if necessary, and diffuses it with an agreeable air motion, yet without draft. In operation it is simpler than opening the windows—and more obvious in results. Its installation in new and old schools of the better sort is due not only to its positive benefits, but its flexible adaptability to any architectural plan.

Architect's Edition of Univent Ventilation will be mailed on request.

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Gold Seal Inlaid
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*A*LL Nairn Straight-Line Inlaid Linoleums now carry the famous Gold Seal with its guarantee of satisfaction. They will be known and advertised as Nairn *Gold Seal Inlaids.*

By thus emphasizing the outstanding dependability of Nairn quality—a recognized standard for nearly 40 years—we offer buyers an assurance of value that is not duplicated in a medium priced inlaid linoleum of high quality.

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INLAIDS
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(See next page)

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There are three types of *Gold Seal Inlaids*—the exclusive, soft-toned, prismatic *Belflor* patterns in both Household and Heavy Weight; *Newark A*, clean cut, solid color tiles in the Heavy Weight; and *Universal*, also in solid colors, in the Household Weight.

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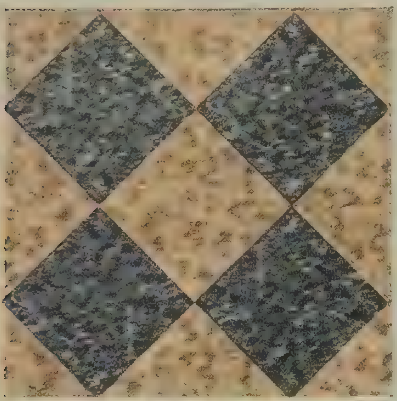
SATISFACTION GUARANTEED OR YOUR MONEY BACK IF LAID ACCORDING TO DIRECTIONS ON BACK OF THE GOODS
REMOVE SEAL WITH WET CLOTH

With scores of pattern effects and color combinations available, the architect can secure a distinctive, yet low-cost floor to harmonize with any decorative scheme.

The new Dutch Tile designs with pattern square with the goods'' are the latest development in kitchen linoleum.



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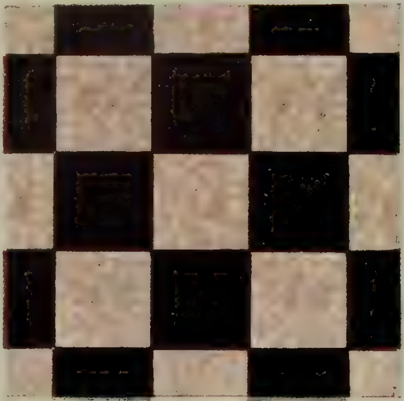

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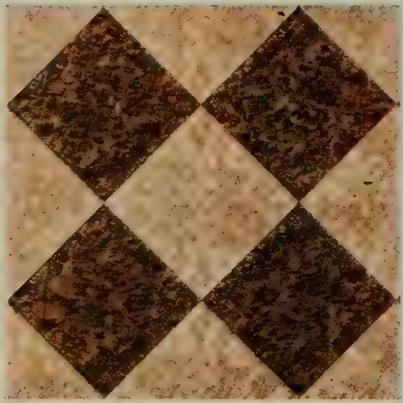

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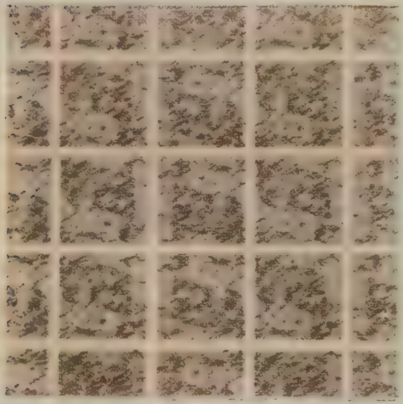

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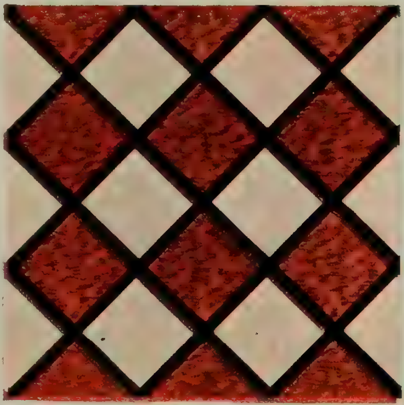

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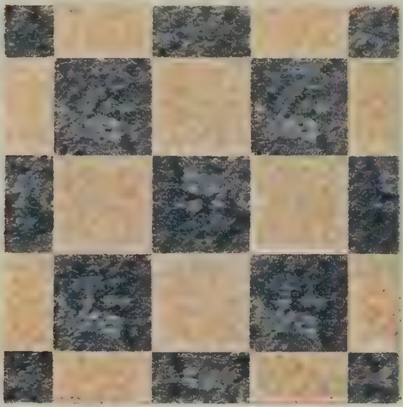

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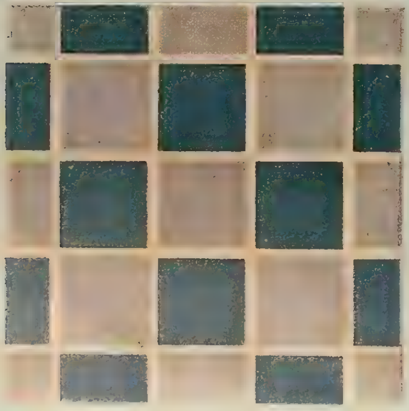

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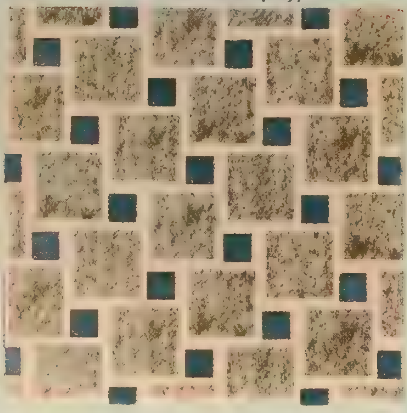

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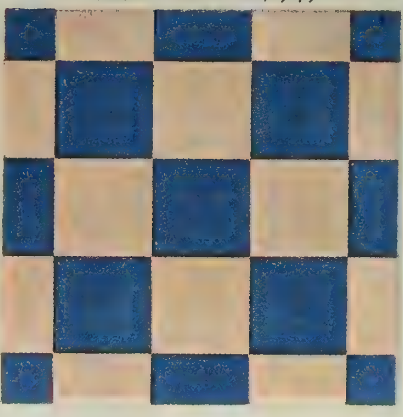
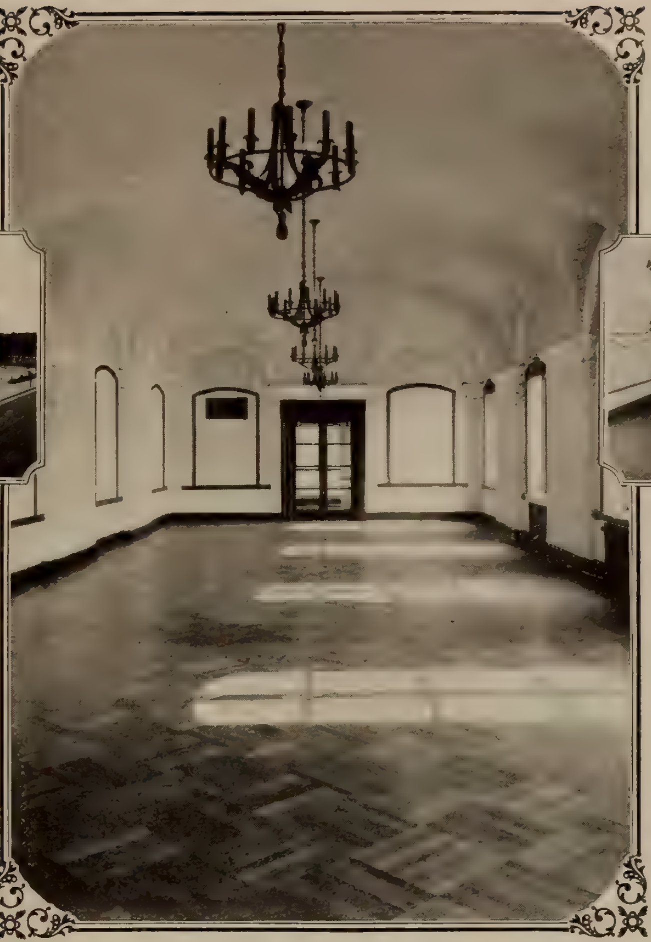


Gold Seal Inlaid
Universal Pattern No. 52/151

(*See preceding page*)

Designed and built for the citizens of Memphis "Down in Dixie," by Charles O. Pfeil and George Awsumb, Architects. The auditorium proper seats approximately 13,000 persons.



Several of the committee rooms, and the foyer are floored with 13/16 x 2¼ clear quartered white Bruce oak flooring. Bruce Beech flooring, in removable sections, was installed in the main auditorium hall.

For the Second Largest Auditorium in the Country

Bruce design flooring gives individuality and richness to the foyer of this wonderful auditorium, the second largest in the United States.

Here we have a large floor expanse, necessarily unrelieved by furniture, affording an exceptional opportunity for the rich dignity of design oak flooring. Nature's own coloration lends warmth to dancing light and shadows. The beauty of the quartered grain in oak is reflected in every strip and square, yet so subdued and pleasing, that the effect over the whole surface is one of absolute harmony.

The Bruce organization has given considerable thought to the decorative possibilities of oak, in strip as well as design flooring, and our findings will be gladly passed on to you. If we can be of assistance in solving a specific flooring problem arising in your practice, please be free to call upon us, without obligation.

See our catalog in Sweet's for specifications, and write for technical literature for your reference files.

Bruce oak flooring, and Bruce "Ceda'line", aromatic Tennessee cedar lining for clothes closets, are sold nationally through lumber dealers everywhere.

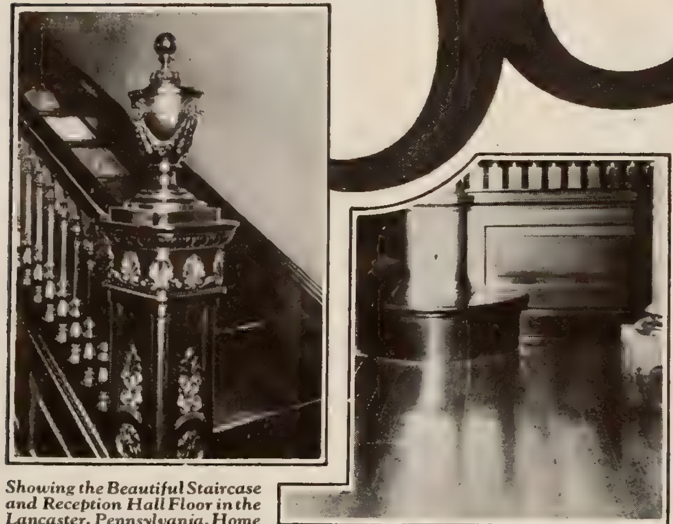
THIS book tells you about the convenience, economy and attractiveness of Bruce oak flooring. The ease with which it may be kept clean and bright; the enduring qualities; the increased value added to any home; appropriate use of various grades and widths, with practical suggestions for different rooms; distinctive effects which may be obtained from color finishes. 24 pages of interesting facts, fully illustrated. Write today for your free copy.

BRUCE

E. L. BRUCE COMPANY
MEMPHIS TENNESSEE

LARGEST MAKERS OF OAK FLOORING IN THE WORLD

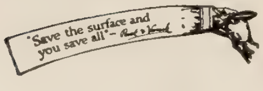
Varnished 30 years ago-



Showing the Beautiful Staircase and Reception Hall Floor in the Lancaster, Pennsylvania, Home of John B. Oblinger—Finished 30 Years Ago.

The White Oak Woodwork in the Flint, Michigan, Home of William Goodes Is in Perfect Condition after 27 Years of Service. "Liquid Granite Is More than Waterproof—It Wears."

...unmarred and beautiful To-day!


"Save the surface and you save all"

WHEN a gallon of varnish is worth $50 and can be bought for $5, the fact is worth knowing.

Read This—

In 1895 John B. Oblinger of Lancaster, Pennsylvania, built the finest residence in town. His architect selected magnificent specimens of walnut, mahogany, hazel, cherry and white oak for the interior trim. It was varnished with Berry Brothers' Luxeberry Wood Finish, the original Hard Oil, and rubbed.

Today there are few homes in America that have more beautiful woodwork than this one. In 30 years it has not been touched with a varnish brush. The finish is as perfect as it was in the days before the Spanish-American War.

The floors in this house were finished with Liquid Granite Floor Varnish. Some of them have been refinished in recent years. But the floor in the reception hall, as pictured above, has never been re-varnished and is in beautiful condition today!

Mr. Oblinger's experience with Berry Brothers' varnishes is neither unusual nor exceptional. There are thousands of home, apartment and building owners in all parts of the world who pay the price for Berry quality in order to save the tremendous accumulative expense of frequent refinishing.

Here Is Another Example—

William Goodes of Flint, Michigan, built his home in 1898 and finished the white oak woodwork with Liquid Granite. A view of the staircase is pictured above at the right. It shows the original varnish. Even the stair steps have never been refinished. Not a single hairline crack can be found anywhere. The finish is as beautiful today as when the painters completed their work 27 years ago!

Mr. Goodes writes: "Your advertisement which says, 'Liquid Granite is more than waterproof—it wears!' is certainly true!"

Figure it out for yourself. If Luxeberry Wood Finish and Liquid Granite give such service as this, you cannot afford to employ substitutes that sell for the same price or less.

BERRY BROTHERS INC.

Varnishes Enamels Stains

Detroit, Mich. Walkerville, Ont.

The Chicago Temple
Chicago, Illinois
HOLABIRD & ROCHE,
Architects

Drawn by Hugh Ferriss

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"Building a Picture"

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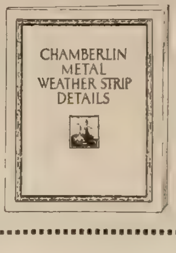

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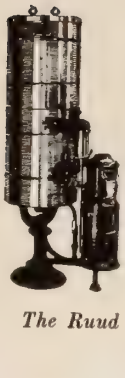

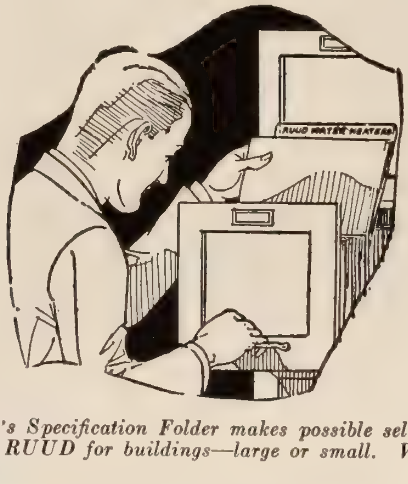

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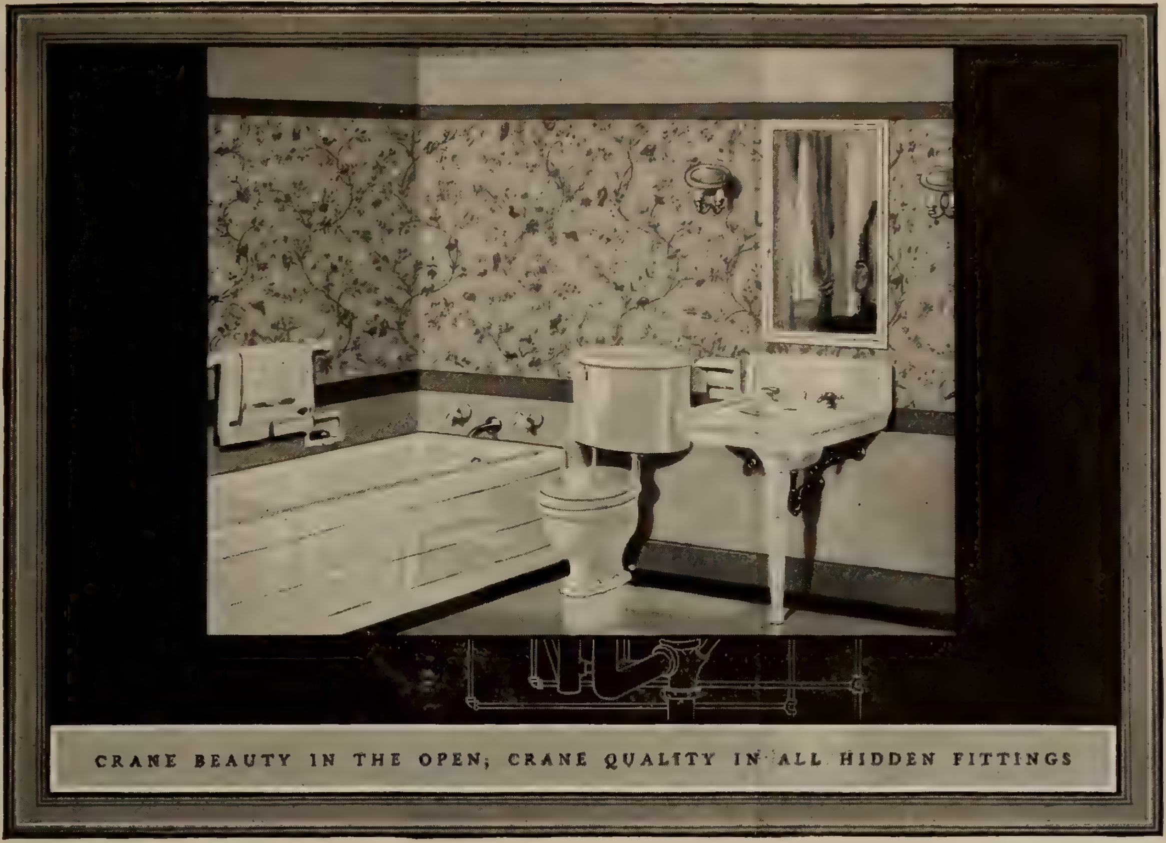
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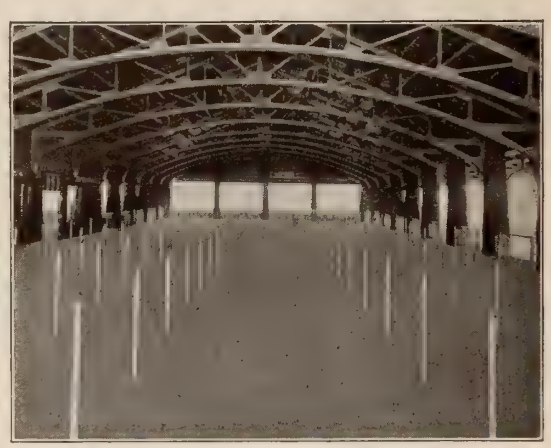

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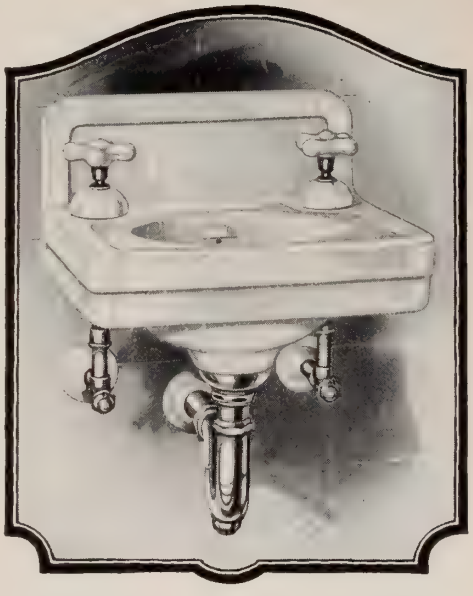

The flushing of the rim washes the bowl continually while in use. There is no metal in the bowl, and only necessary valve stems are exposed above the slab. Plan your next bathrooms to include this important appointment.

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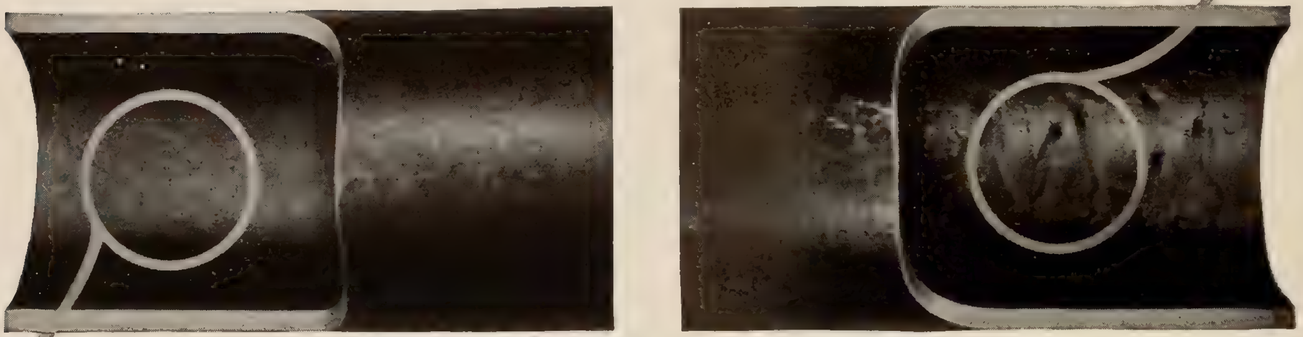

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At right—Edge-grain red cedar shingles such as are used exclusively in the manufacture of WEATHERBEST Stained Shingles. The edge-grain assures lasting color, freedom from curling and warping and lifetime resistance to depreciation.

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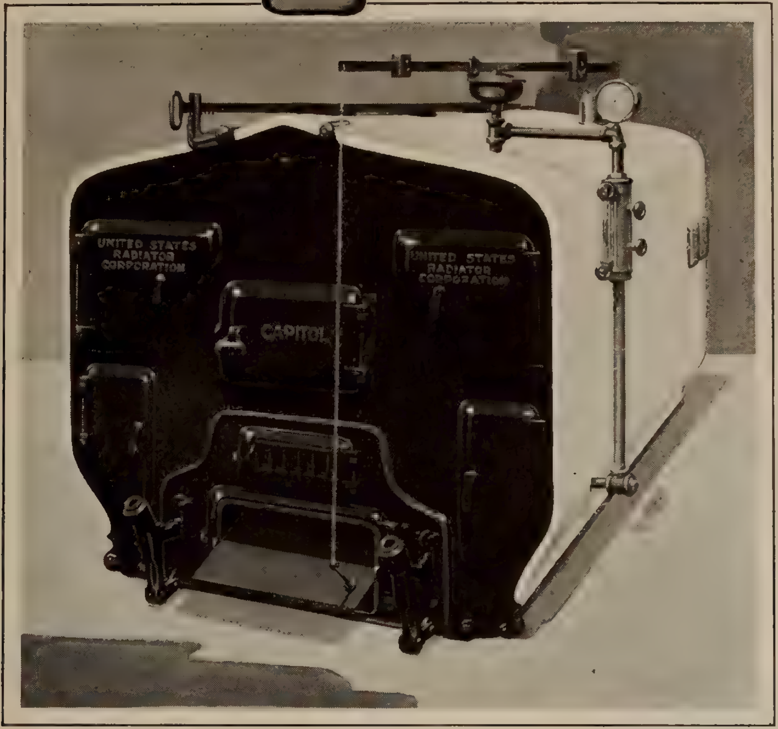
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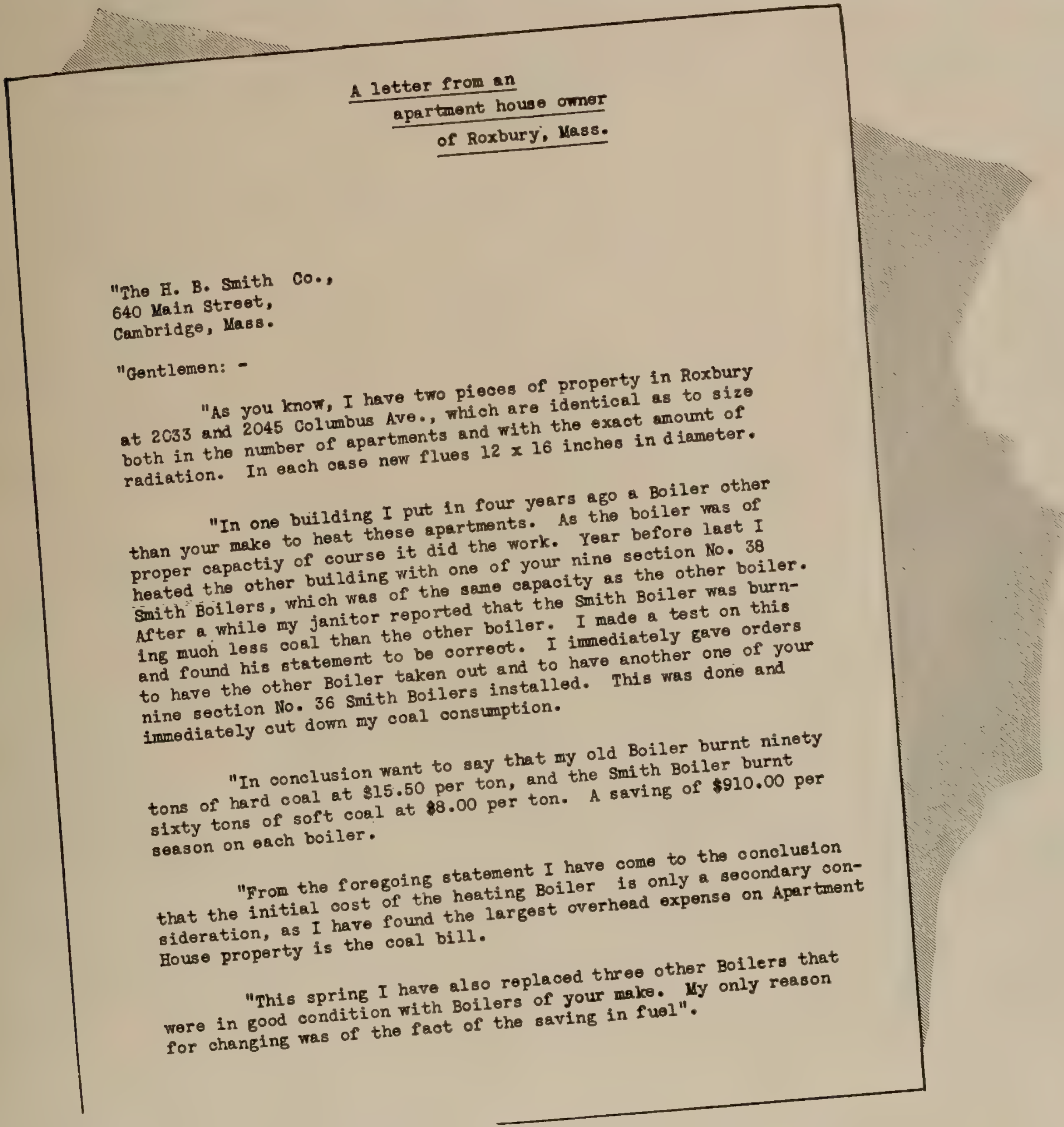

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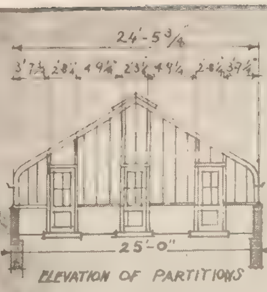

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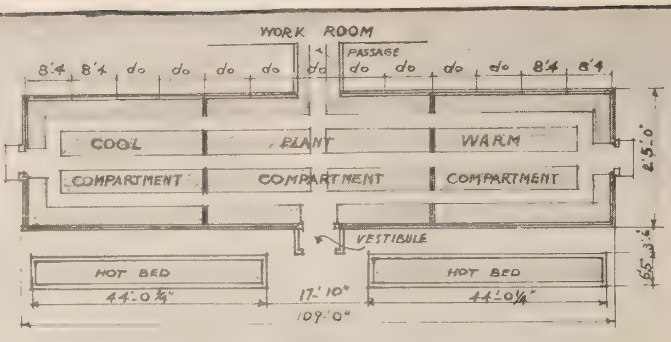
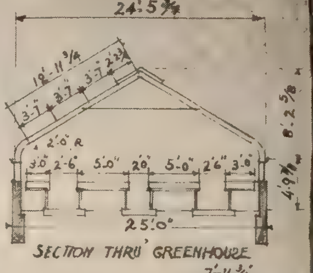
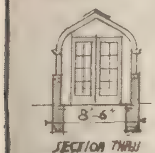




SECTION THRU' GREENHOUSE



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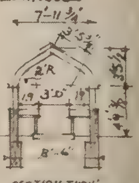

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The adding of a parallel house with a connecting passage between either the workroom or the greenhouse, continues the balance and economies of both working and heating.

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SEPTEMBER 1925

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Published by Charles Scribner's Sons
THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. LII SEPTEMBER, 1925 NO. 3

The Effect of Gravity on Building Construction

By H. Vandervoort Walsh
Professor of Construction, School of Architecture, Columbia University

Article I

HOW IT HAS INFLUENCED OUR IDEAS OF ARCHITECTURAL DESIGN

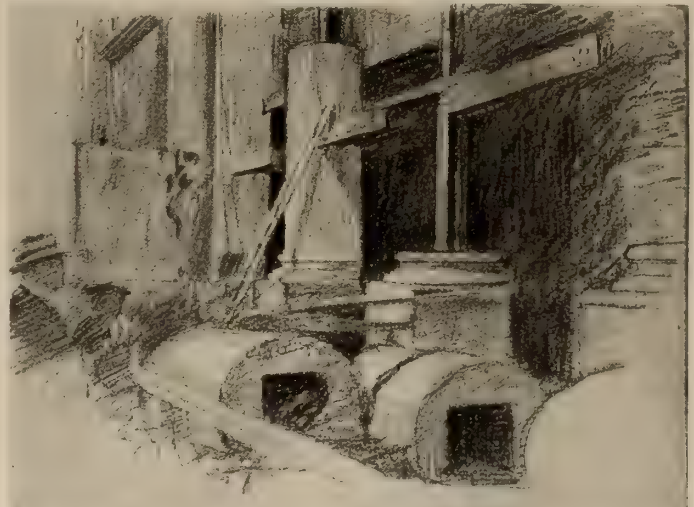
THERE is a simple story in the "Dialogues of Saint Gregory the Great" that illustrates how little the mediæval architects and masons knew of the action on a building of the force we call gravity. About the year 530 A. D., when Monte Casino was being erected, the masons found that a certain stone had taken on great weight and would not be lifted from the ground. News of it was reported to Saint Benedict, who explained that it was the devil holding on to it. He accordingly prayed that the stone might be released from the devil's grip, and it came to pass that it was, for he himself was able to lift it and set it in place.

In this day and generation there are architectural designers who, although they are not quite so ignorant of the mechanics of construction as our ancestors, are, nevertheless, uninterested to learn about it, and boast of having passed through some course on the subject in college and afterward having promptly forgotten the matter. Such mysteries they leave to the engineer.

This attitude of mind is but another indication of that weakness of intellect which characterizes most of us to-day, including architects. We glibly talk of the scientific mind that has made our age different from those of the past, and yet most of us go on thinking in the same dreamlike manner, accepting ideas as true simply because they are hoary with age. Especially in our architectural schools do we emphasize the acceptance of an idea because it is old and has passed safely through the criticism of many generations. Nearly 90 per cent of our educational methods in architecture are based upon the assumption that because an idea is old it must be good. Students are taught to accept the suggestions of their critics of design without too many questions, because these critics are older. They are not supposed to do much arguing about them, since, they are told, taste and things of art are not to be reasoned about, but are matters of feeling. In their history courses they study the old masterpieces of architecture as models to copy from. They learn that the Greek temple is one of the greatest examples of architecture and are encouraged to copy its details in creating new buildings. Indeed, we could enumerate one thing after another to show that the architect's training emphasizes the notion that an idea must be good if it is old and has tradition in back of it.

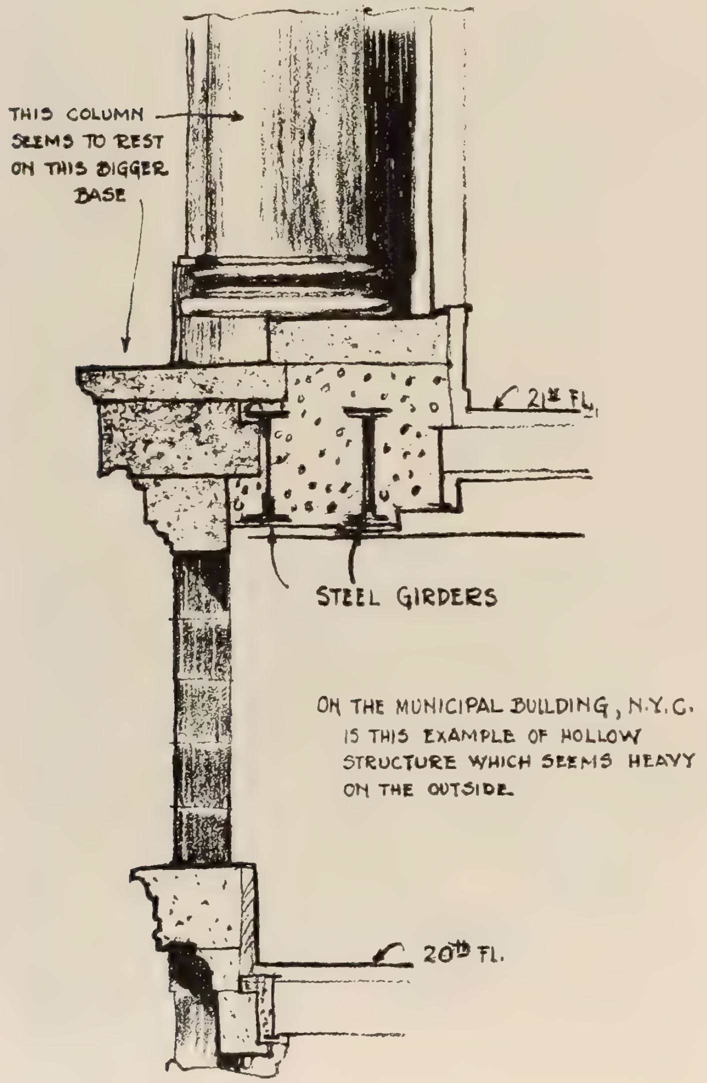
American architects as a class believe that architecture is like a language, and that the words are already established in the traditional styles developed by our ancestors. It has been said that whenever a good and original design is conceived, it is because the architect cribbed his ideas from a book or similar source not previously used by other architects. We are constantly warned that all conscious attempts at originality have failed, and that originality consists in using traditional forms in a suitable way to fit our new plans. Many believe that this conservative spirit has made our architecture advance beyond any other contemporary art.

But it must be noted that in this architects are, after all, thinking about the same way as others to-day. Most people are conservatives. The radical is the exception. The majority accept ideas because they are old. Few question the established order of things.


THE ARCHITECTURAL FAT GOING OVER THE BONY STRUCTURE

And yet a strange thing has happened in architecture. We have learned to build in a very different way than our ancestors. This new method of construction is the result of the investigations carried on by a few independent thinkers. The steel frame, reinforced concrete, the truss, Portland cement, the Guastavino dome, and other features of modern construction are absolutely new and are the children of knowledge developed by a few individuals who refused to accept ideas simply because they were old. Instead of blaming the action of gravity on the devil, they began to investigate it, trying this and that combination, and they found that it worked according to certain principles. Our ancestors never asked what was going on within the various structural members of a building. They never even conceived of the idea of forces working within a building.

It is ridiculous to picture the mediæval builder as a great engineer, understanding the action and counteraction of forces within the vaults and buttresses which he built. He did nothing of the kind. His knowledge of the mechanics of a building were not in advance over those which any boy to-day would observe in playing with toy building-blocks. Indeed, they learned to construct very much the same as a boy learns how to build with these blocks. He sets them up, piling them in this or that shape. Perhaps it is a tower he wants. Higher and higher he piles the blocks until the tower trembles and topples as he places on it the last block. From this he learns how high a tower he can erect.


THIS COLUMN SEEMS TO REST ON THIS BIGGER BASE
21st FL.
STEEL GIRDERS
ON THE MUNICIPAL BUILDING, N.Y.C. IS THIS EXAMPLE OF HOLLOW STRUCTURE WHICH SEEMS HEAVY ON THE OUTSIDE.
20th FL.

With not much more science the builders and architects of antiquity constructed walls, columns, lintels, and vaults from the experience they had gained from previous attempts that had failed. If they tried anything new, it was experimental. Their testing laboratory was in the field. They were never sure that a new type of building would stand until it did actually do so. The unwritten histories of architecture and construction are the lost records of the churches, temples, domes, vaults, and towers that fell and which taught their builders great lessons in construction. Historians of architecture do not refer to these mistakes, except casually. The falling of the central towers of the cathedrals in the Middle Ages was not uncommon. We have evidence that some of the buttresses and arches which were erected in these buildings threatened to collapse. For example, the tower of Gloucester Cathedral began to push over its supporting walls and to save them, inclined buttresses were hastily erected inside and out and a bracing arch was thrown across the transept. A similar bracing of the structure is shown in Wells Cathedral. Buttresses and flying buttresses are, after all, only permanent methods of shoring up piers and walls which have begun to fall over.

When a building is constructed in this manner, the builder is sure to be a little fearful of the results. He is not quite certain whether the structure will stand after it is finished. Lest he make a mistake, he errs on the side of safety by using structural parts much larger than necessary. As a result, his buildings are massive and oversubstantial.

Indeed, one of the basic ideas that all designers in architecture insist upon as a principle of composition is inherited from this primitive fear that the building might not stand up. This principle of design is usually stated in the following manner: All buildings and all ornamental composition must seem to be stable. That is, the very obvious and simple mechanics that a boy with building-blocks would work out must not be visibly violated. From this such rules of design as these are evolved:

1. A building should have a visible base.
2. Walls should be made to appear thick in order to make the building look strong.
3. The corners of the building should be strengthened visibly with rustication, pilasters, or similar things.

These accepted rules of architectural composition are derived from primitive fears for the safety of the structure. The buildings erected by our ancestors naturally conformed to these rules because their knowledge of the mechanics of construction was derived from the most childish observations. Architects accept these principles of design to-day simply because they are old and have traditional examples to give them weight.

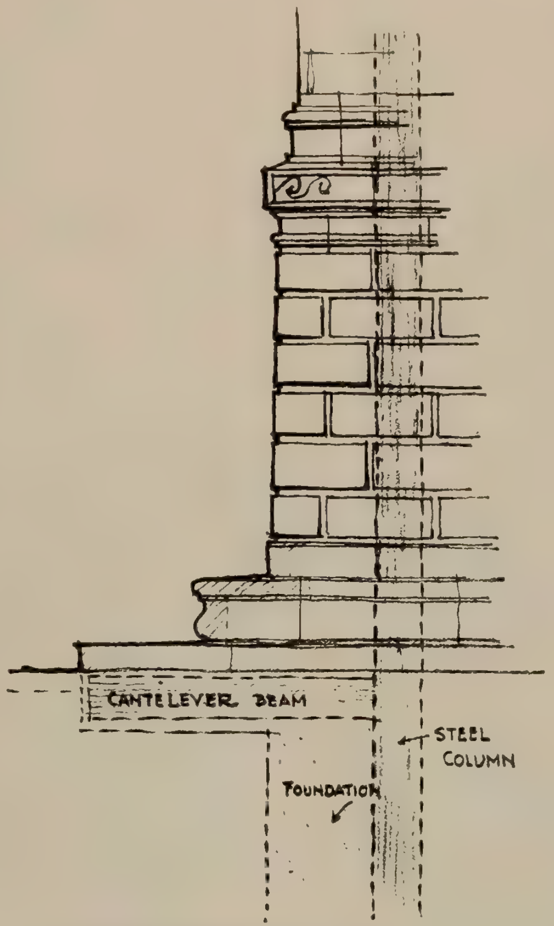
However, in modern times, a few have learned much deeper things about construction than our ancestors knew. But our architectural designers continue to follow the old rules of composition which were derived from primitive fears of our forefathers, and, accordingly, do some very illogical things.

For example, designers feel, because of these traditional notions of construction, that every building should have a visible base, like a masonry platform, upon which the building seems to rest. In order to do this, we go to such extremes as in the St. Louis Library to stick out, from the foundation walls of the building, steel beams to support the sham base of the building. We also design the walls of our monumental buildings to look very thick, although they are hollow when actually built. This is for the purpose of giving an impression of stability, for our ancestors had to build thick walls, and our ideas of strength are derived from their monuments. For years architects have been disturbed by the unstable appearance of tall office-buildings, resting on plate-glass windows. Is this not a curious state of things, to be annoyed at the apparent unstability of a building that is very stable? How can a thing be stable and not seem to be?

Thus we are faced with a very unreasonable condition of affairs in modern architecture. We spend millions of dollars to make our buildings look buildable according to the old notions of what was buildable and stable. Our designers are thinking in terms of childish and primitive mechanics, but our buildings are constructed according to newer and sounder ideas. Does it not seem reasonable to say that modern designers ought to bring their ideas of construction up to date? We need designers who will think independently and not merely accept ideas because they are old. They should know some of the things the engineer knows, only in a different way. They should have a developed sense or feeling of the action and reaction, bending and shearing of forces within a structure, so that their designs will reflect the newer knowledge of the mechanics of construction, and their sense of proportion and stability be developed beyond the primitive ideas of the architects of antiquity.

At present the training in the schools of architecture that the young man gets in applied mechanics and structural engineering is so divorced from his work in design that he looks upon these subjects as barriers in the way of his degree. They do not seem, in any way, to apply to the real problem of the architect, namely, creative designing. He is told by older architects that problems of structural engineering are turned over to an engineer to-day, and that the architectural designer never has any need of this knowledge. Accordingly these studies do not make the impression upon the student of architecture which they should. They are forgotten, as a closed and distasteful book.

It is not right that such a point of view should exist, and we are going to attempt in this series of articles to show how valuable to a designer can be the knowledge of the action of forces in a building. We will try to present the matter in such a way that it will give him a key by which he can develop his sense of construction, not as our ancestors knew it, but as we know it to-day.



HOW THE AESTHETIC BASE OF THE PUBLIC LIBRARY OF ST. LOUIS IS SUPPORTED

Good Workmanship Essential to Good Stucco

THE selection of a stucco contractor who knows his business and can show that he has done good work is the most important factor in securing good stucco construction, the Bureau of Standards of the Department of Commerce finds. At least, in the present state of the art more depends upon capable workmanship than upon many of the details of the specifications. The successful stucco specialist may be expected to know the requirements of the specifications, and will also have acquired a knowledge of the application of the material which can be learned only by experience. The plasterer trained for interior work does not have this necessary knowledge and experience, the bureau believes, and the saving in cost by hiring an inexperienced man will be made at the expense of appearance and durability of the job.

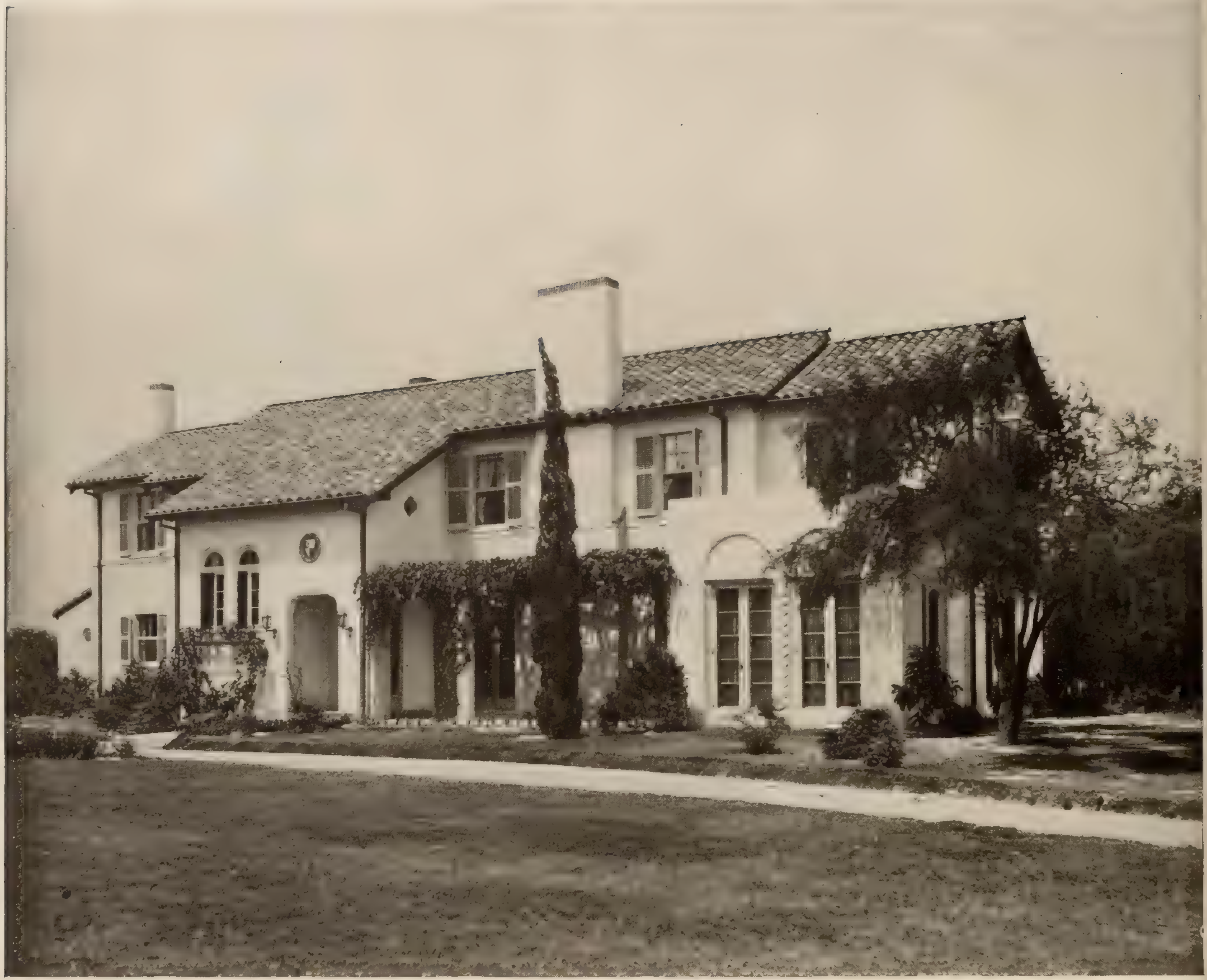
Tests on stucco construction have been in progress at the bureau since 1911. Panels of stucco made in accordance with different specifications have been constructed and exposed to the weather for a number of years. Some of these panels were of back-plastered construction; some were made with wooden sheathing. Paper-backed construction, plasterboard, and other types were also tested. Still others were applied to walls of masonry.

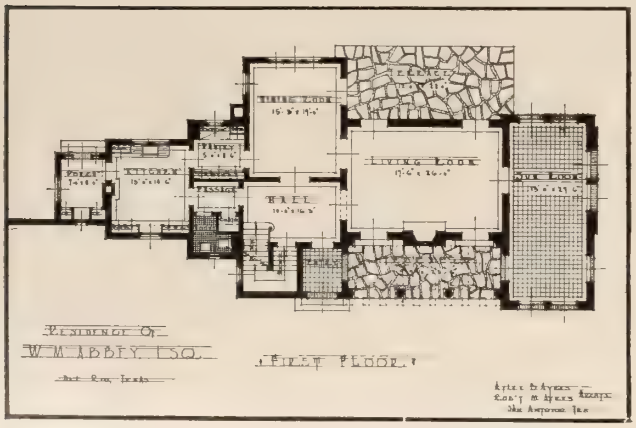
Measurements of the shrinkage of stuccos were also made by means of a special comparator. It was shown that this shrinkage may be controlled, to a large extent, by regulation of the amount of water used. The general rule is that the material should stiffen from removal of water before chemical set occurs, and the ability to recognize this condition is considered a necessary part of the plasterer's practical knowledge of his craft.

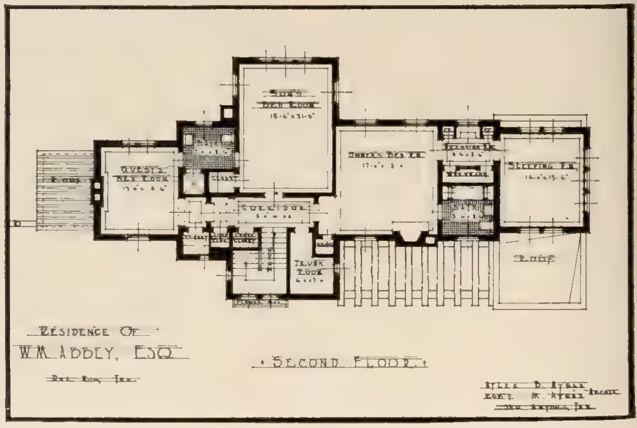
Masonry walls were found to make the best bases for stucco, and on them the finest stucco textures can safely be used. Fine textures are not recommended for use on frame construction, as they show cracks which are not visible in coarser textures. Where stucco is used on wooden frame the frame should be well braced, and the use of metal or wire fabric or metal lath for reinforcement is recommended. The tests showed that better results were obtained by omitting the sheathing, using special insulation and bracing where required. If sheathing is used it is thought horizontal sheathing would be preferable to the diagonal sheathing which was used in most of the sheathed test panels.

Special attention, the bureau says, should be given to the tying or lacing of the fabric or lath so that the joints do not constitute a line of weakness in the reinforcement.

Lean mixtures were found to give the best results. A mixture of one part cement, one-fifth part of hydrated lime, and three parts building sand is the richest recommended. Good design is considered essential and involves adequate flashing and overhead protection, and the restriction of stucco construction to vertical surfaces or to those which will drain quickly.







RESIDENCE, W. M. ABBEY, DEL RIO, TEXAS. Atlee B. Ayres, Robert M. Ayres, Architects.

American Church-Building

By *Arthur Foster*

WHILE it is true that ecclesiastical art has hardly kept pace with the strides made by commercial and domestic architecture, it hardly deserves the quite general adverse criticism which it receives, for it has so wonderfully advanced during the last thirty years that to-day we have, especially in our smaller churches, examples of good architecture, at least equal to anything that has been done in Europe during the same period.

Before that time church-building in America was practically only of two kinds. First, and most generally, designs were put forward of buildings which were intended to meet modern requirements: these, naturally enough, ignored precedent, and with some notable exceptions were not successes; indeed, in some cases have come to be regarded as monstrosities. Secondly, especially in larger work, adaptations of existing European work more or less meritorious were attempted, and on the whole were perhaps as good as anything contemporaneous along the same lines that was done in other countries. Many of the quasi-Romanesque and Gothic churches which were put up from thirty to fifty years ago reflect great credit on their designers, and are to-day worthy of study, despite the wholesale condemnation heaped upon them by some of the present generation of architects, who, one is tempted to say, show no evidence of ability to equal, much less to surpass, them.

Just about thirty years ago church architecture received a tremendous impetus; English Gothic came to be regarded as the logical style for the churches of this country, and the leading exponent of this theory, a most voluminous writer on the subject, clearly stated that any style other than the chosen—not only of country, but of period—was taboo. This view of the matter came to be generally accepted by people of taste, and the building committees of non-Catholic churches cheerfully abandoned the meeting-house type of their forefathers and encouraged designs based upon purely Catholic precedent. Little by little this most facile of all the styles has broken away from mere archæology and has developed proportions and features in designs that are no longer copies of ancient work, but yet breathe the true spirit of Gothic tradition. Our architects are becoming more eclectic, and as a result the beauties of this style are no longer confined to buildings of the traditional plan; and, since all the styles are transitions from the preceding ones, it would seem perfectly logical to combine their appropriate features in a design regardless of the particular period in which they were originally employed.

It is passing strange that the Catholic Church has held herself aloof from the Gothic revival. Despite the fact that the English churches which served as motifs during these years were all pre-Reformation work, and as such Catholic heritage and germane to Irish work of the same period, and hence apparently of strong appeal to this large following in the church, she nevertheless came to look upon clerestory plans, stone interiors, and open-timber roofs as being essentially Protestant, and as a consequence has not profited by the recent impulse toward mediæval architecture.

But there is no question that she has wonderfully improved the design of her buildings during the same period. Notable examples of Renaissance, Byzantine, and Mission churches abound. The Romanesque style has been revived; even Colonial architecture has been pressed into her service, and some attempt has been made, though with no marked success, to disregard precedent altogether and to build in the Modern American style, though just what this may mean as applied to a Catholic church is hard to say.

This prejudice against Gothic is aimed only at what is felt to be certain of its salient characteristics. The long, narrow plan (aisle columns being especially taboo), with its comparatively high roof, and its intricate ornamentations, necessitating a great cost of construction, are among the chief objections raised to it.

But the Gothic style should not, in justice to the church's heritage, be lightly cast aside. It is at once peculiarly the child of the church and, as such, the style of all lands, and it has shown its adaptability to climatic conditions in the great cathedrals of all the countries of Europe. One has but to compare the works of northern and southern Italy, England, France, Germany, and Spain to see how this style can express the different civilizations in which it has been used, and, being the natural expression of universal religious sentiment, it will be found to be equally adaptable to American civilization in the twentieth century. It is based upon no hard and fast rules of proportion, its possibilities have by no means been exhausted, and it is capable of adaptation to modern methods of construction and utilitarian considerations to a degree which can perhaps hardly be claimed by the other great schools of architecture. Perhaps, as good an example as any of this particular quality is in the accepted design of what aspires to be the most beautiful skyscraper type of office building in the world. Then, too, stone is by no means the arbitrary material in which it must be constructed, for with the wide range of brick now available, this, and even conceivably terra-cotta, may enter largely into the design of our future church buildings, affording scope for color effects not always possible with stone. The little brick churches of northern Italy have furnished motifs for some of our best work and illustrate at once the adaptability of this material and the feasibility of designing in the Gothic style independently of what has come to be looked upon as its traditional plan, *i. e.*, the long, narrow, clerestory building with lofty roof.

In considering the future of church-building we are, of course, dealing with the subject only as a place of worship and ignoring the various activities that have come to be housed in the same group, sometimes, indeed, rivalling in importance the church proper. Such adjuncts with their broken plans and varying heights lend themselves most happily to Gothic treatment.

The "long-drawn aisles and fretted vaults," so characteristic of the great churches of Christendom, must, alas! perforce be sacrificed to modern requirements. These, in our more important towns, are generally for as large a building as possible with a seating capacity of say one thousand, all of which must be in sight of the altar and as near to it as possible, so that a plan approximating to the Greek cross would appear to be the logical one. The Byzantine style at once suggests itself as the suitable design for such a plan, though it is common to both the Renaissance and

Romanesque schools, as well as to the Mission style, which was apparently founded upon them, and hence there is no reason why it should not be designed to embody consistently many Gothic features, as the Mission style especially offers many possibilities of combination with them. The Pacific slope furnishes us with many examples of what may be accomplished along these lines, the Spanish rendering of this style entering most happily into such compositions. Indeed, when we consider that Mission is the one type of architecture indigenous to the soil, we may at least surmise that it will yet become the long-waited-for American ecclesiastical style.

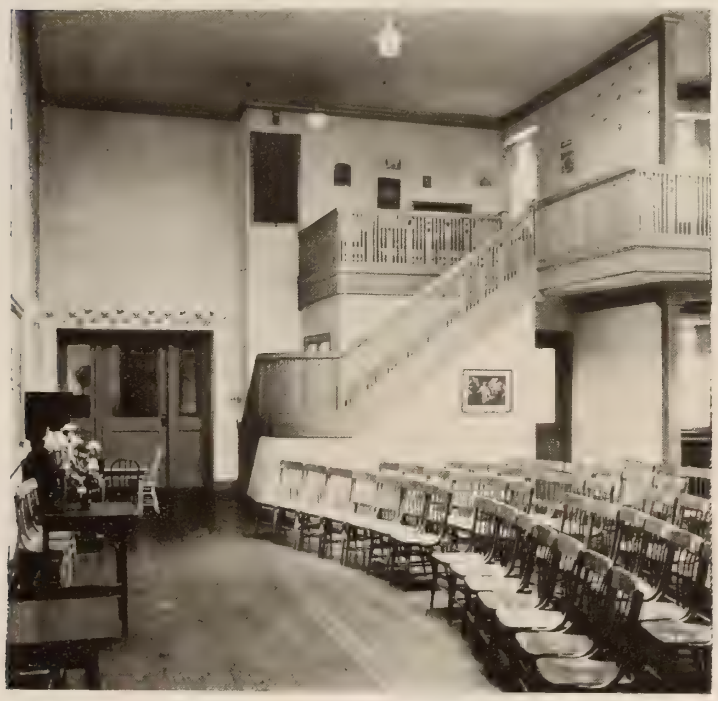
The design under consideration would, of course, gain enormously if columns were introduced outside the seating areas, though by throwing arches across the transepts and arcading the side walls, the converging-line effect can at least be suggested and further enhanced by as long and narrow a sanctuary as the points of sight will allow. The length of the building could be consistently increased by putting the organ and choir loft over the narthex, and the ceiling treatment made to emphasize the long and narrow proportions so potent in ecclesiastical work; the whole forming a composition to which Gothic treatment would lend itself admirably.

While no large church has yet been attempted along these lines, there are a number of smaller ones by some of our leading architects in which Gothic features, such as arches, traceries, and moldings, are used in buildings whose masses are suggestive of Romanesque planning. Buildings of the period in which this style merged into Gothic could be studied as motifs, and in cases where the plan more nearly suggests Mission feeling, Gothic as it was elaborated in Spain and southern Italy would seem to be the most logical form to use.

But Gothic, in some form or other, appears to the average layman a sine qua non of the church.

A Church Building Planned to Meet Present-Day Needs

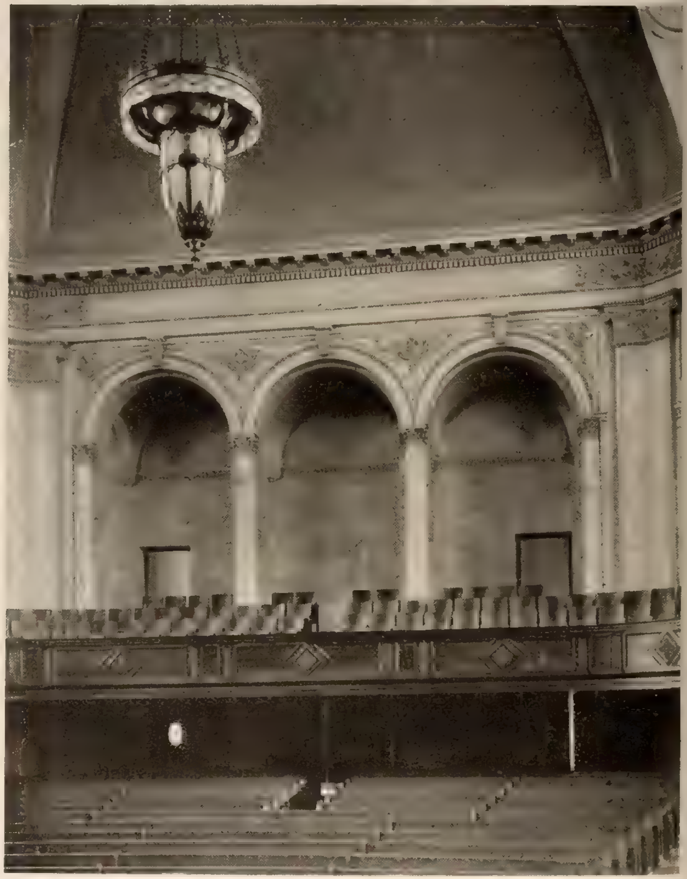
IDEALS of church life and service are most surely reflected in the buildings which the churches erect for their housing. Modern church designs thus set forth modern conceptions of church functions. We offer in these pages a building design which illustrates and declares the varied ministries of the First Baptist Church, Knoxville, Tenn.



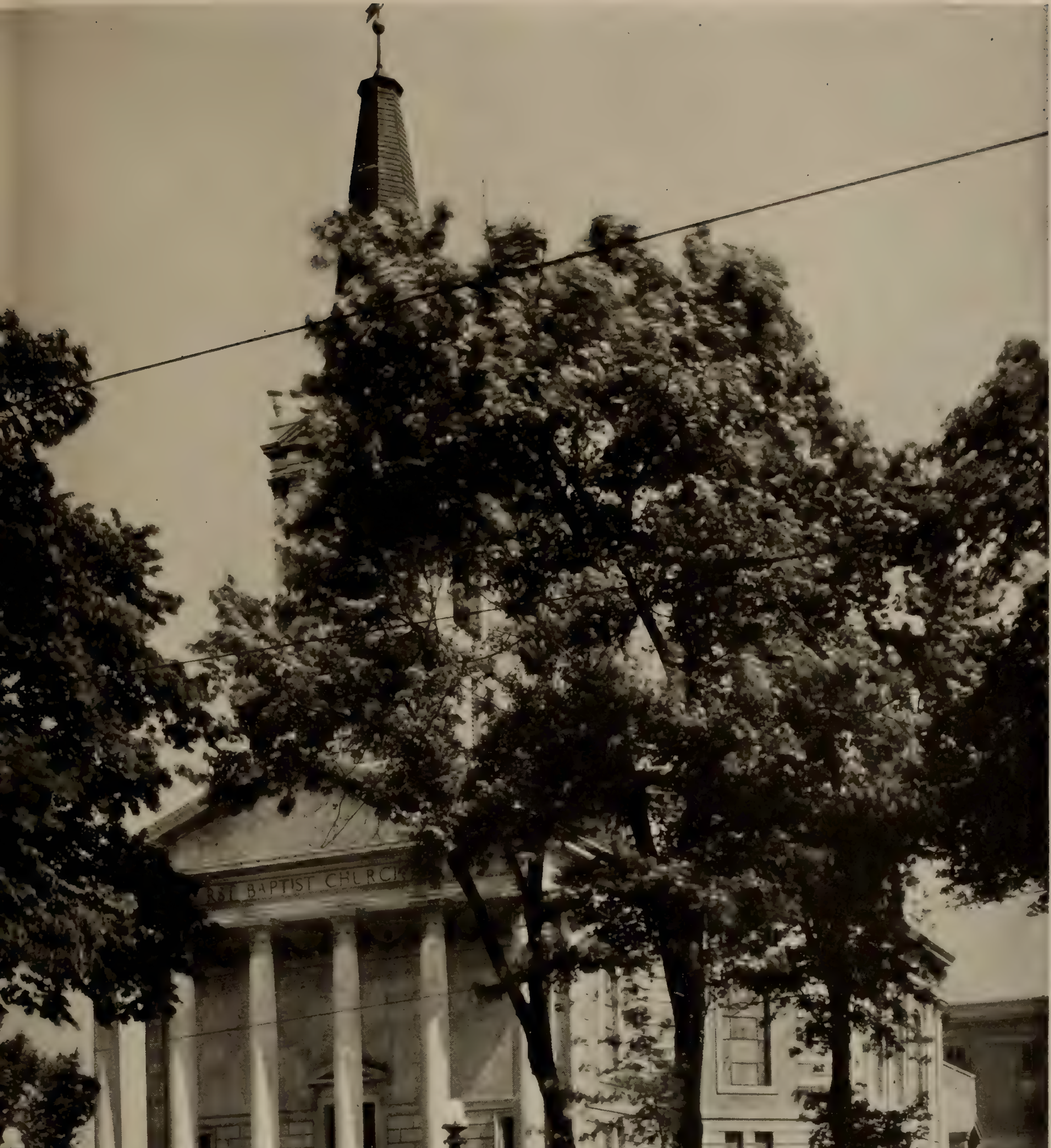
A classroom, Sunday-school, First Baptist Church, Knoxville, Tenn. Dougherty & Gardner, Architects.

Design Secured Through Competition.—The building committee, feeling its great responsibility and facing many difficulties, decided on a carefully regulated competition as the safest means of securing a suitable design and of selecting a capable architectural firm. Doctor Warren P. Laird was asked to conduct the competition. Doctor Laird visited Knoxville and made a careful study of the local situation, holding extended conferences with the committee. A complete schedule of provisions to be offered in the new building was wrought out; this schedule was carefully studied by the pastor and the local committee, attention being given even to the minutest details, until an acceptable programme was agreed upon.

Under the guidance of Doctor Laird, the committee selected five architectural firms to enter the competition. A jury of award, consisting of disinterested architects, acted as judges in the competition. This jury, together with the local committee, selected as the winning design the building presented in these pages, offered by Messrs. Dougherty & Gardner, Architects, Nashville, Tenn.

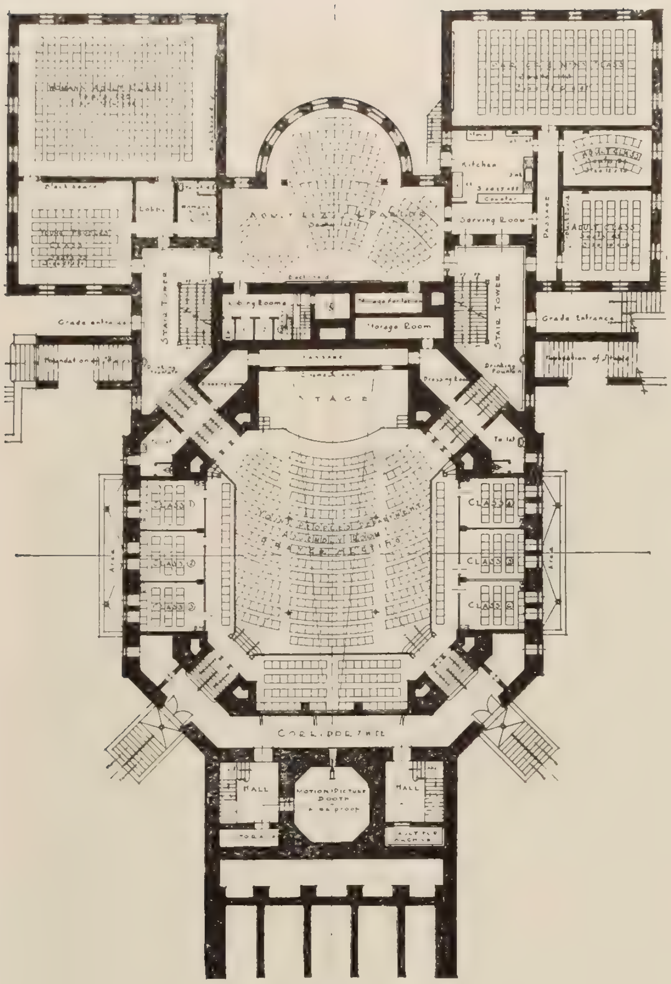


Balcony over main entrance, First Baptist Church, Knoxville, Tenn. Dougherty & Gardner, Architects.

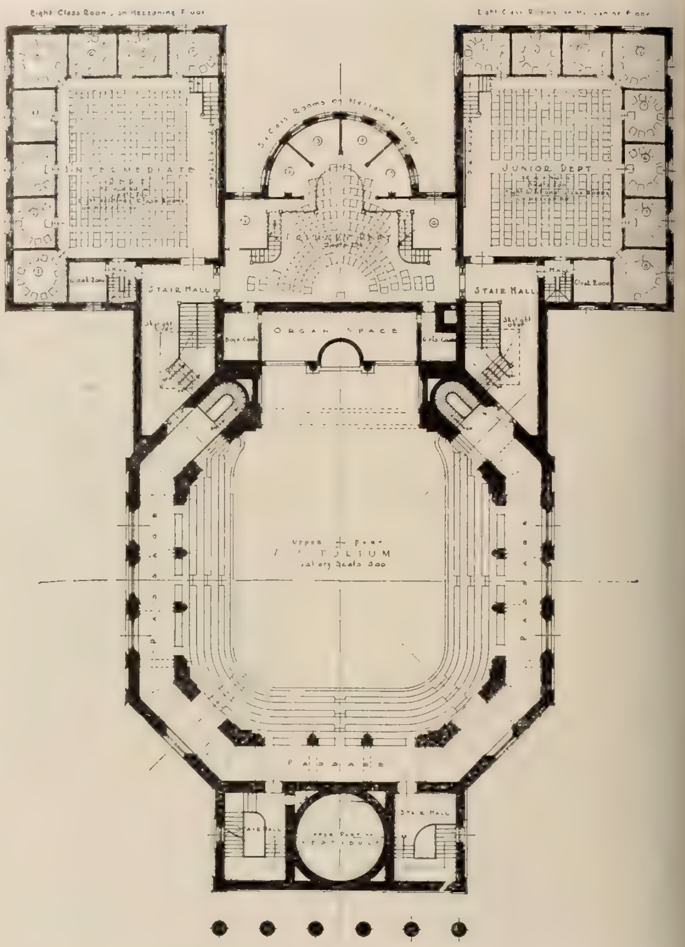


IRST BAPTIST CHURCH, KNOXVILLE, TENN.

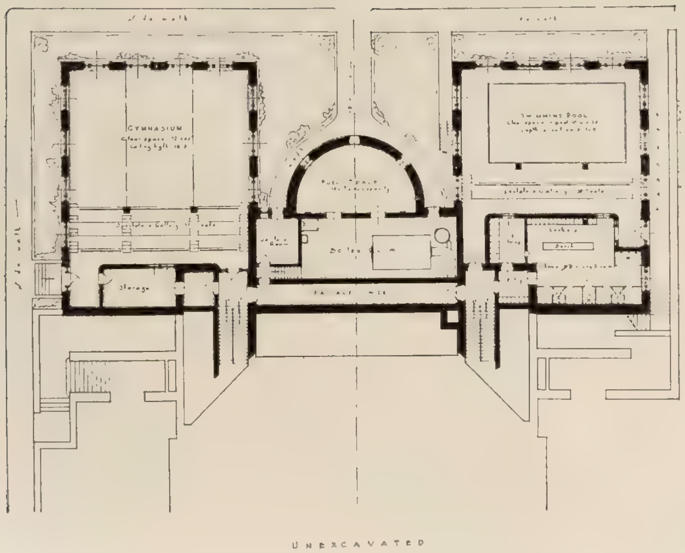
Dougherty & Gardner, Architects.



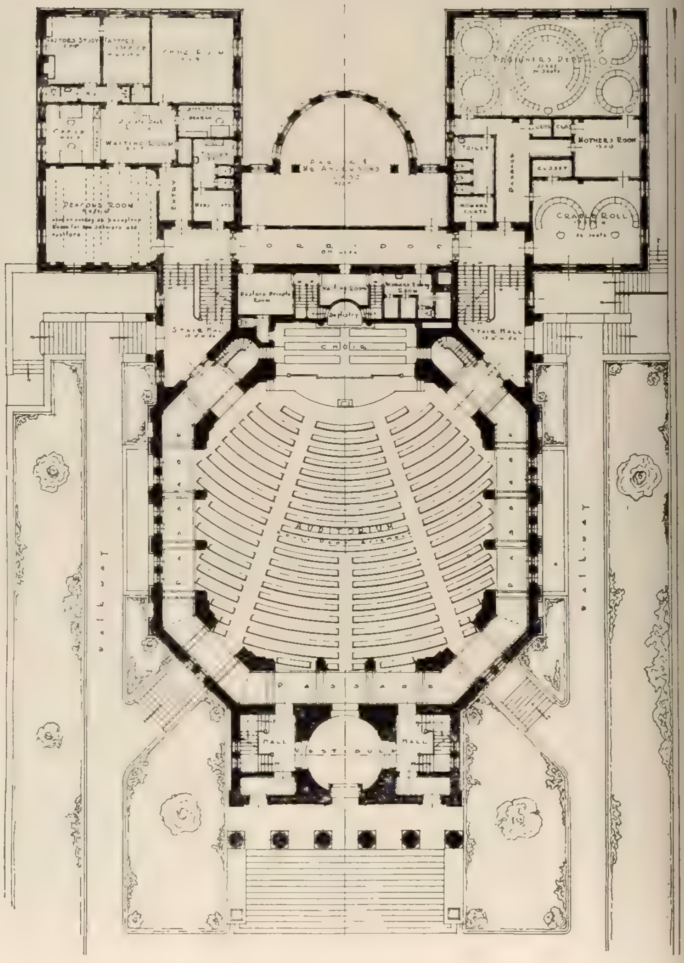
GROUND FLOOR PLAN



BALCONY FLOOR PLAN



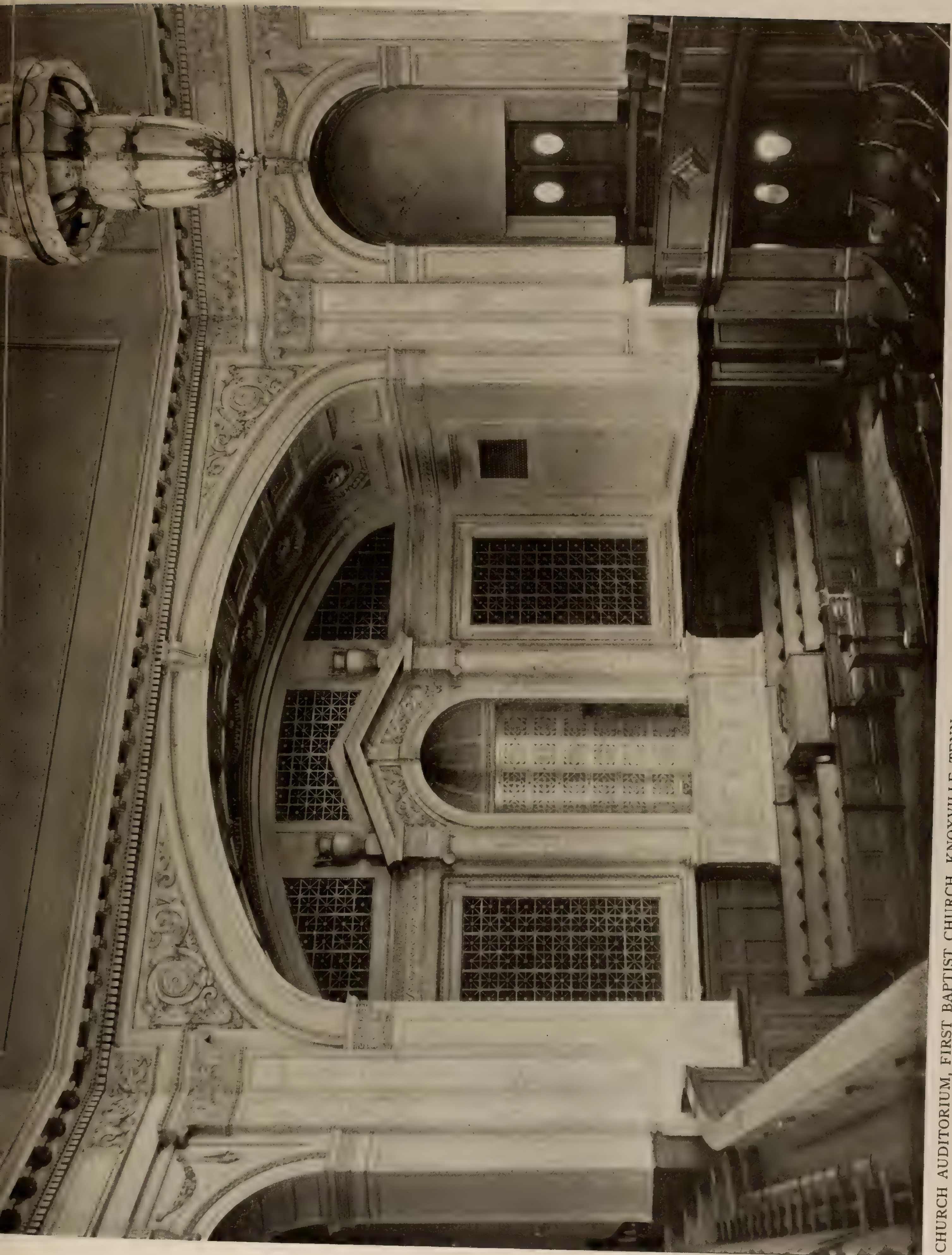
RECREATION (Basement) FLOOR PLAN



MAIN FLOOR PLAN

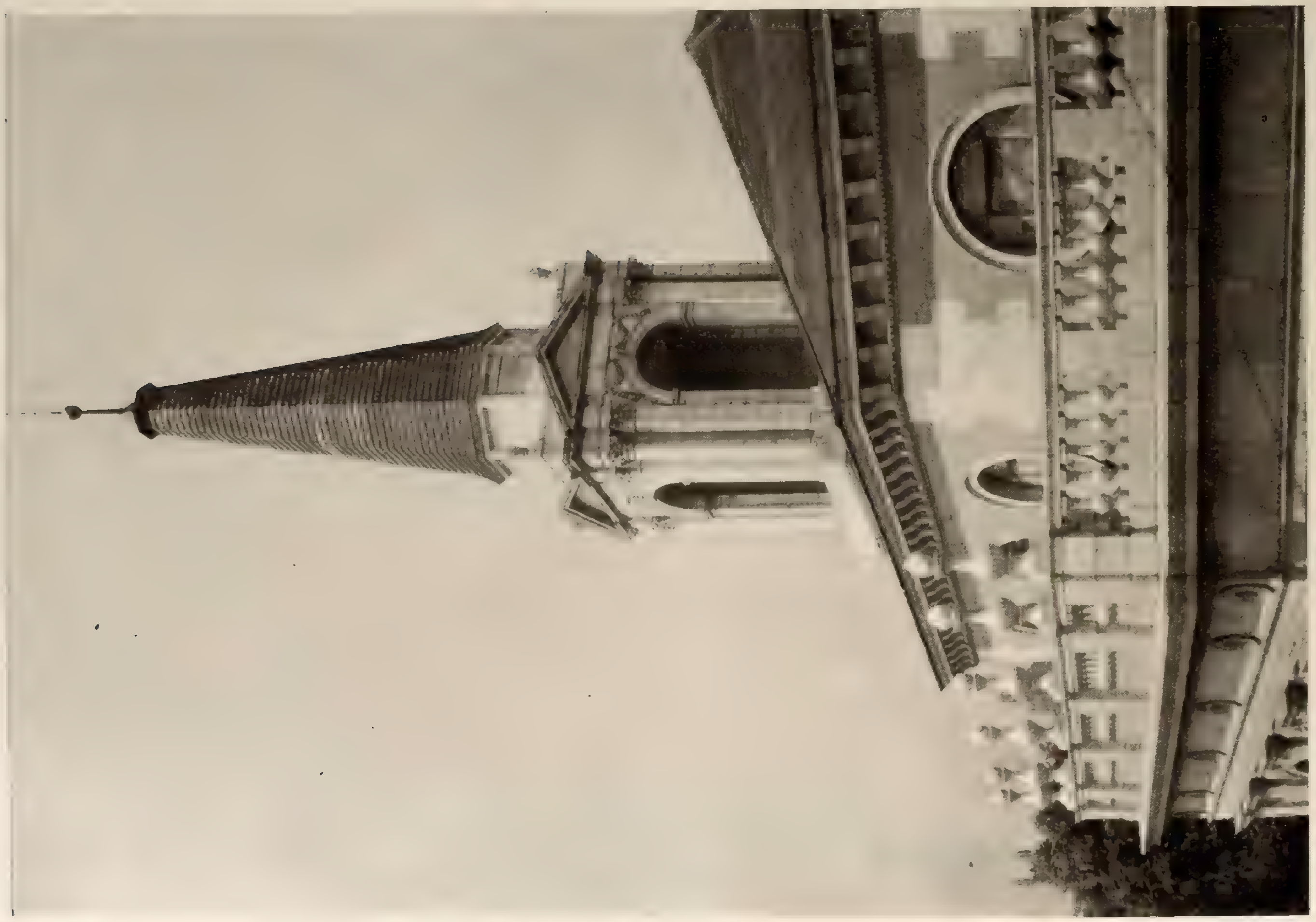
FIRST BAPTIST CHURCH, KNOXVILLE, TENN.

Dougherty & Gardner, Architects.

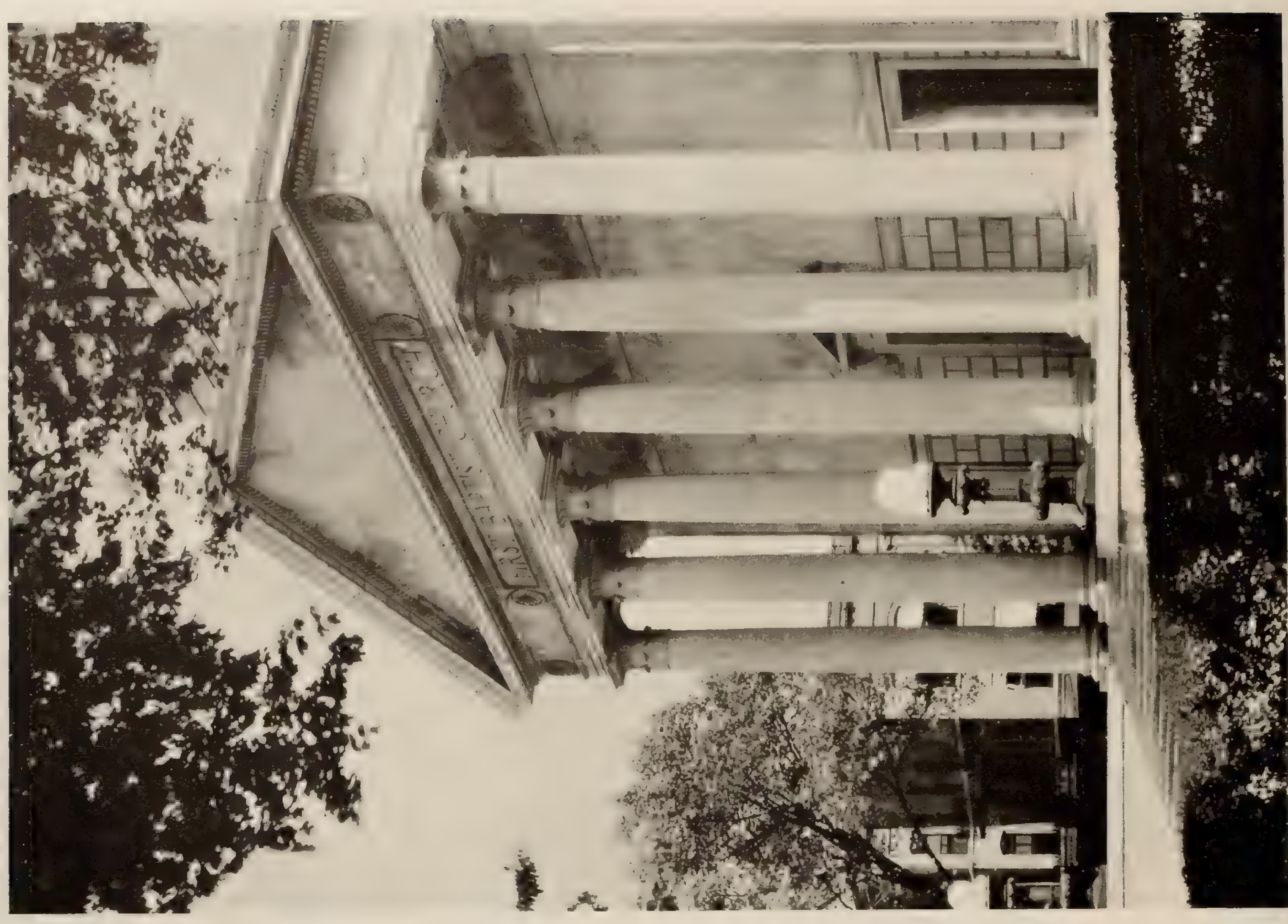


CHURCH AUDITORIUM, FIRST BAPTIST CHURCH, KNOXVILLE, TENN.

Dougherty & Gardner, Architects.



DETAIL OF DOME AND SPIRE.



PORTICO.

FIRST BAPTIST CHURCH, KNOXVILLE, TENN.

Dougherty & Gardner, Architects.

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Editorial and Other Comment

Old-Fashioned Doctrine

ONCE upon a time we used to be told that a man was to be judged by deeds, not words; we were to be seen but not heard unless we really had something worth saying. But times have changed. This is the age of words, of publicity. The county weekly that thrives on the local items, "Sally Smith spent Tuesday in Danbury," "Deacon Johnson's new flivver has proved a bucker," etc., is rivalled by the big city papers, and personalities fill much space, even in organs devoted to such purely utilitarian matters as trade. You have to look mighty sharp for the man or woman who is hiding any wee bit of light under a bushel. There are rushlight flashes, lightning-bug glimmers catching our merry eyes wherever we go. Day and night on every highway little lanterns are telling us that their owners are on the way. Here and there we hear a voice crying in the wilderness and daring to show a decent and becoming respect for something not associated with flash-lights.

Sir Reginald Blomfield, one of England's greatest architects, a man of fine scholarship and broad sympathy with all the arts—our readers will remember his great "History of French Architecture from the Death of Mazarin to Death of Louis XV"—writing of Greek architecture says:

"A recent critic justified the antics of certain artists by the necessity they were under of advertising themselves. That, no doubt, is the readiest way to immediate success. But the question for the critic is, not the personal advancement of the artist, but the value of his work; and one would ask if any good work at any period in the history of art has been inspired by this ambition to shout louder than one's neighbors. Certainly the standpoint of the Greek was the exact opposite. He did not seek notoriety. He was happy with his inner vision of beauty, and intent only on its realization. He had not the smallest desire to shock or startle any one. There are occasions when shock tactics are necessary, but they are not necessary every day in the week, nor is it necessary to make a clean sweep of the past before one sets to work in one's own little corner of art."

He says a lot of other things we'd like to pass on: "The lesson of the Parthenon is the lesson of a steadfast vision of beauty, held high above individual effort and failure, realizing itself not in complex detail or calculated eccentricity, but in serene and exquisite simplicity of form. It teaches us that in the arts there are no short cuts, and that anarchy, the destruction of what has been won for us in the past, is not advance, but the straight road to the bottomless pit of barbarism."

"Capability Brown"

THE more closely one studies certain contemporary criticism of the arts, the more convinced one is that it is inspired by the dictum of the celebrated Capability Brown that knowledge hampers originality, says a noted English architect in an essay on "The Outlook of Architecture." The modern tendency to let the dead past bury the past has given us such things as Cubism, Gaugouin, Matisse, and others. Writing of a painting by Van Gogh, a critic remarks that "this rush chair becomes an object of profound significance, eloquent of the life of those who have used it, of the clumsy hands that have shaped it, and above all of its essential nature as a chair!"—Can you beat it? and this sort of stuff is taken seriously. Brown would deny us all reference to the good things that have made for better art; he would evolve an architecture from his inner consciousness, and the less he knows, the more he assumes the authority to dictate to those who have spent their lives in an honest but misguided effort to profit by the brains and experience of the past.

We have many Browns "in our midst," and if they shout loud enough they are heard by the man in the street, and for a little, brief time become prophets in the land.

Have You Something to Say?

ONE of the constant, unremitting, and insistent problems of an editor of a magazine like ARCHITECTURE is to persuade the other fellow to believe that he has something to say and knows how to say it. In the way of general and promiscuous writing the editor's task is usually much easier; he doesn't have to do any persuading. Every Tom, Dick, and Agnes knows he or she has something to say and can say it with words. Popular magazines are deluged with manuscripts of all kinds; everybody under the sun wants to say something. But architects are too busy or too modest to go rushing into print without persuasion, and apparently, as a class, like to mind their own business. We are fairly good persuaders, but we can't always get at or have the proper talk with the persuadee. We sometimes wonder why it is that some of our readers who suggest interesting articles don't sit down and beat out their thoughts on a responsive typewriter or dictate their "stuff" to the young lady secretary who would just love to write an article.

We have had a lot of good suggestions regarding ways of making ARCHITECTURE better; its pages are hospitably inclined toward your special experiences, and there are many of our readers who have things to say worth saying. Practical articles appeal to us, but when we say practical we don't always necessarily mean something about how to make bricks lay. As a matter of record, some of the best practical articles ever published have been some that were filled with facts plus a personal note—born of experience—on the right use of facts. It's the old human equation that touches up even the dullest job with a bit of inspiration.

We are always in a receptive mood toward contributions of a helpful and constructive character.

A Letter from the Past President of the Southern California Chapter of the Institute

To the Editor of "Architecture"

Dear Sir: In your June issue I noticed a number of articles on the subject of Allied Architects Association of Los Angeles, and as a past president of the Southern California Chapter of the American Institute of Architects, I would like to express a few of the many things I might say on this subject.

I am very sorry that your magazine as well as a number of other magazines publish all the advertising matter that the publicity department of this organization furnish you, particularly as you make no charge for same. I feel that it is time you stop publishing their trash, which is misleading the architectural profession of the United States, until you have made an investigation of the true facts of the situation.

If you listen to their stories, this organization has advanced architecture several generations ahead of its time, but, as a matter of fact, it has set the practice of architecture in southern California back farther in three years' time than it has advanced in any generation.

In this particular letter, above referred to, in the third paragraph, the author makes the statement that their work is limited to buildings of public character. They have failed to tell you that they run a common drafting-room, and that many of their members have done away with their architectural offices and have now become brokers, chasing the streets of our cities to get work at the best possible figures, and then dickering with this drafting-room as to the cost of turning out the plans and specifications. Some of the work done in this way is criminal. Several particular examples being buildings erected in Santa Barbara, where the recent earthquakes did so much damage. Had this work been in the hands of competent architects, several lives would have been saved. Another instance is a city school in the city of Los Angeles, where the drawings were made by this drafting-room, and the resulting errors have brought discredit on the architectural profession. Over twenty-five sheets of drawings were incorrect, and the bills of extras, presented by contractors, involved over $55,000 on work that cost but four times that much.

In this same paragraph is a statement that the membership comprises sixty-nine of the leading architects of southern California, and that brings up the question of what is "A Leading Architect." As a matter of fact, this organization is comprised of a group of men not more than five of whom have either experience or ability to handle large work, and the rest have been inveigled into the group with the vision of being a party in the constructing of our great public buildings.

In the fourth paragraph there is a statement that the members do not work for personal profit. This is an absolute falsehood, as the members are paid for their time spent, and the amount they receive is more than most of them receive in private practice; in addition to this, certain officers have received quite nice sums of money.

They state that they maintain a school of architecture for university students, where, as a matter of fact, their members are acting as instructors in the class of architecture at the local university.

They make the statement that they have, out of their funds, spent $45,000 for preparing a complete civic-centre plan for the city and county of Los Angeles, which, by the way, is a dream, and has never been accepted. I defy this organization to come out in the open and allow me to show them where this $45,000 came from, for this money was obtained by direct fraud, and the taxpayers of southern California are paying it.

This article mentions the commission of preparing plans for a $5,000,000 addition to the Los Angeles County Hospital, and they harp on how interesting it is to see the remarkable hearty co-operation on the part of the sixty-nine architects, etc. As a matter of fact it is a disgrace to the architectural profession to see the way that this job is being handled, with apparently no one in the whole organization with any experience or ability to build the building in a workmanlike manner, or in a reasonable length of time. I believe I am not far astray in saying that almost one year has been spent and only sketches made. I forgot to mention that the allies employ a paid politician, or, more properly, a "ward-heeler."

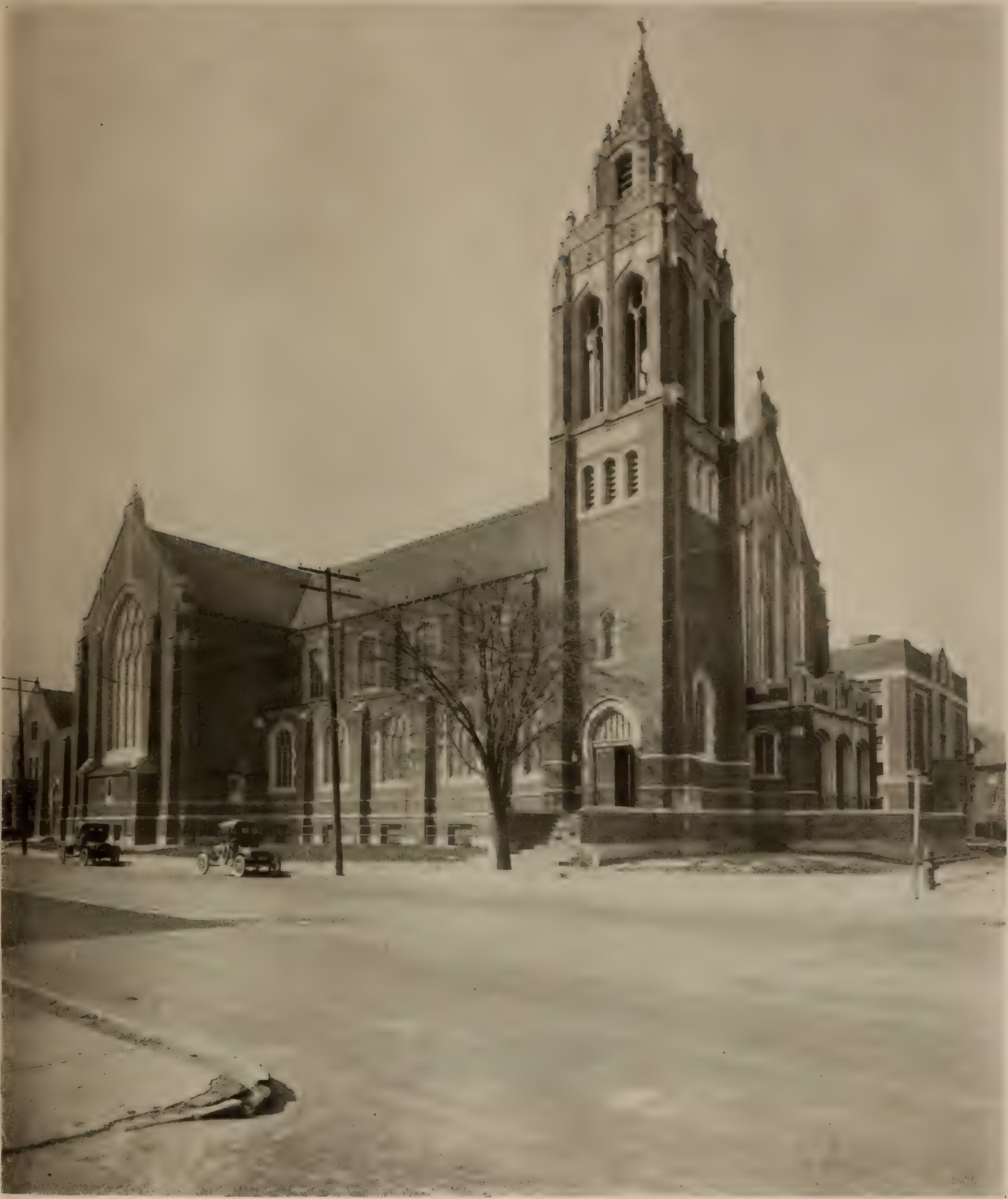
I should stop, but before doing so will tell the architectural profession that twenty-one months ago our local Chapter was astounded when the nominating committee entered the meeting-room on election night, with a list of nominees, including those of delegates and alternates, with every name on the list a member of this group. When my attention was called to the fact, I took the floor and asked them to be square. They had the house packed, and laughed at me. Again at last election they repeated the performance, and now hardly any one attends the meetings excepting this group of "leading architects," who have never been able to make a success in their own private practices, and who have resorted to this wild dream to get a chance to build a big building. To-day most of the Chapter meetings are held in the offices of their corporation.

Hoping that other chapters will beware of the propaganda of this institution, and trusting that we will soon have our chapter a meeting-place of men who place the interest of their profession above their own selfish interests, I am

Sincerely yours, Albert C. Martin,
Architect, Past President of the Southern California Chapter of the Institute.

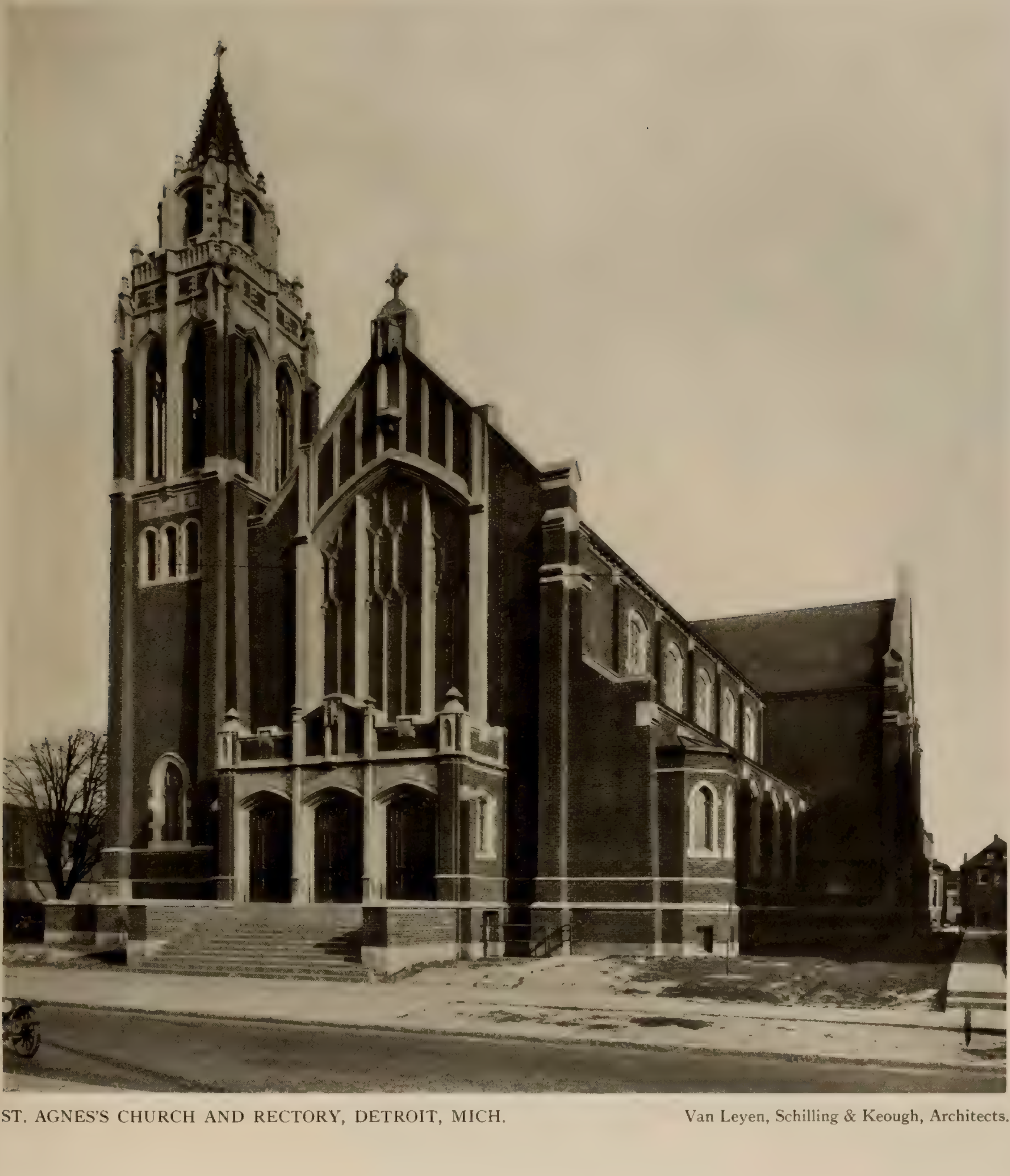
Exhibitions of the Philadelphia Chapter of the Institute

THREE exhibitions have been held or projected by either direct action of the Chapter or in connection with others. The Annual Exhibition in conjunction with the T Square Club was, of course, the most important of these. Held at the new Art Museum and in the corridors of City Hall, it has had probably the largest attendance of any exhibition we have ever held, and accordingly has gone far toward upbuilding the prestige of the profession. Six other Philadelphia organizations also collaborated in this. The exhibition the Chapter sent to New York during the Convention made an excellent showing, and was very favorably commented on by delegates from all over the country. Some of the Chapter exhibitors were asked as a result of this to send work to the exhibition held by the Cambridge School of Domestic Architecture and Landscape Architecture at Cambridge, Mass. As this letter is written another exhibition is in the making, a travelling exhibition of Philadelphia Chapter Work to go out this autumn under the auspices of the American Federation of Arts, the work to be selected and started off by our own Committee. All honor and appreciation to those self-sacrificing and hard-working members whose organization and execution of the nasty million and one grinding details of collecting, judging, and arranging makes these exhibitions a success, and by that a credit to all of us.

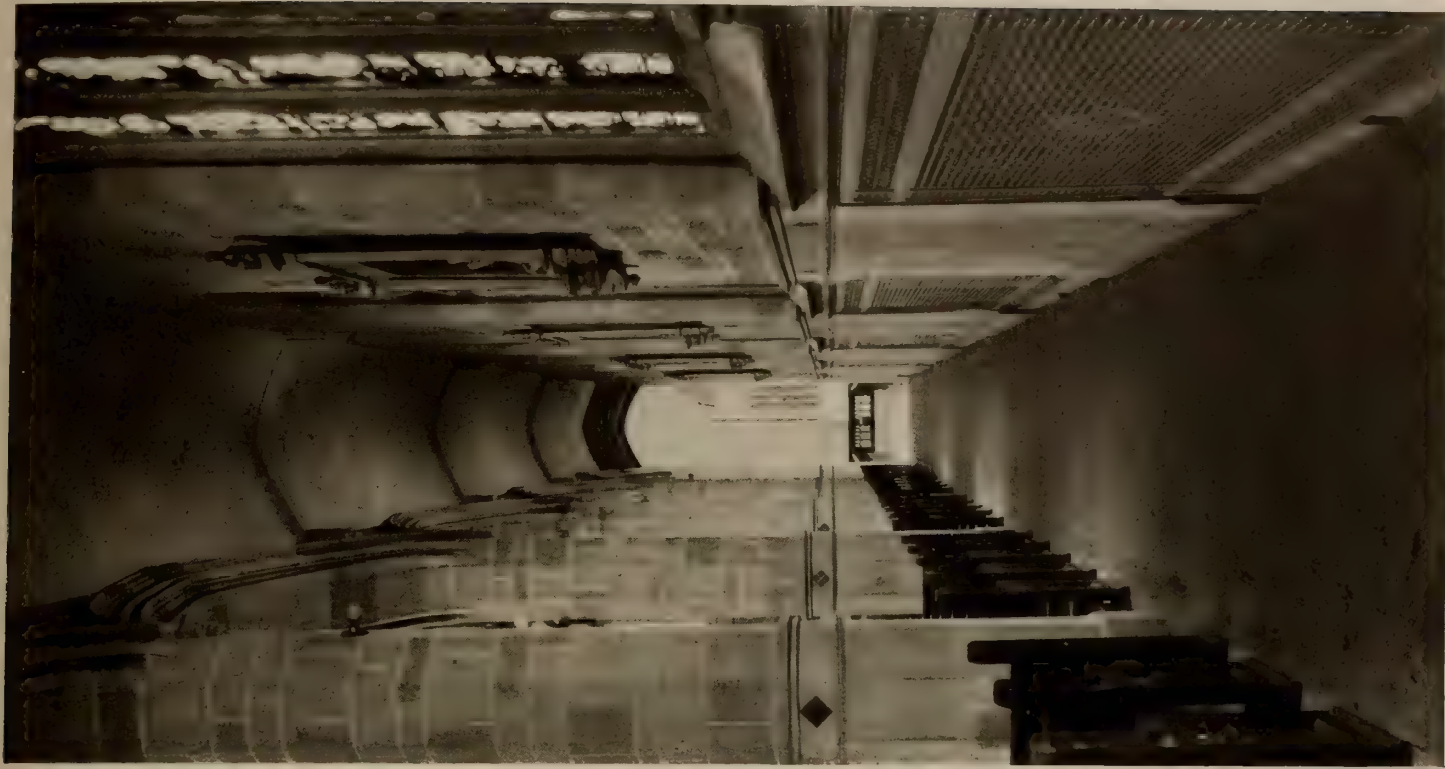


ST. AGNES'S CHURCH AND RECTORY, DETROIT, MICH.

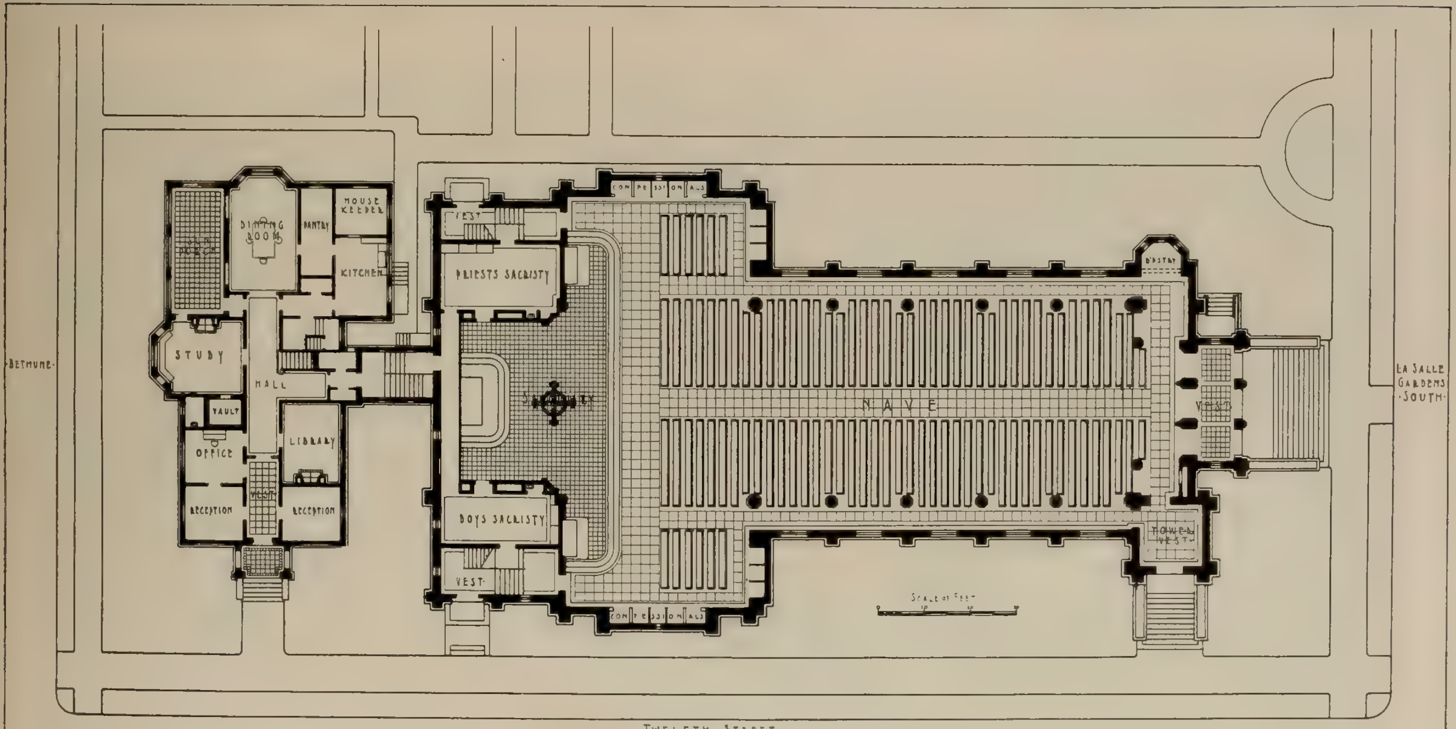
Van Leyen, Schilling & Keough, Architects.



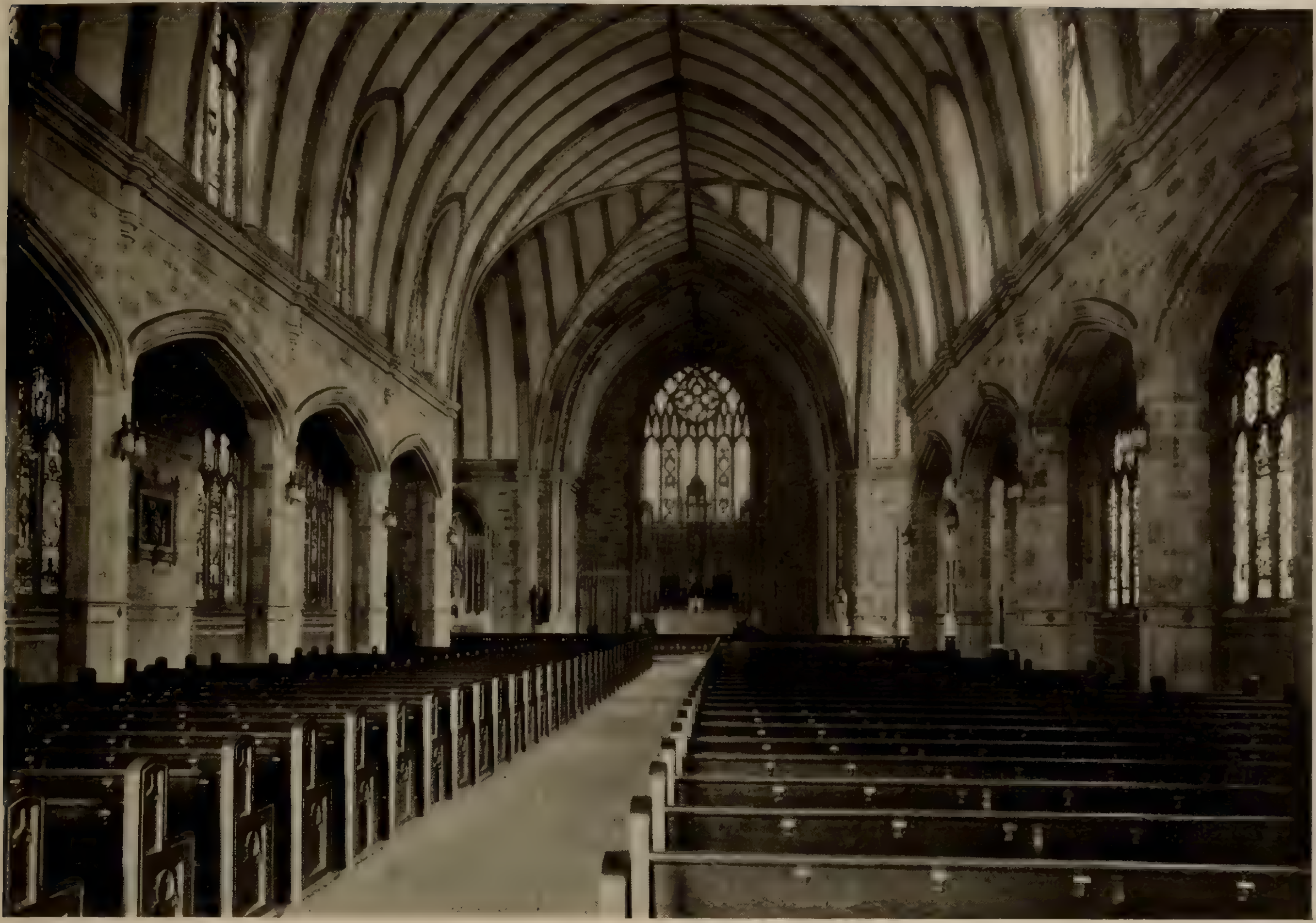
ST. AGNES'S CHURCH AND RECTORY, DETROIT, MICH. Van Leyen, Schilling & Keough, Architects.

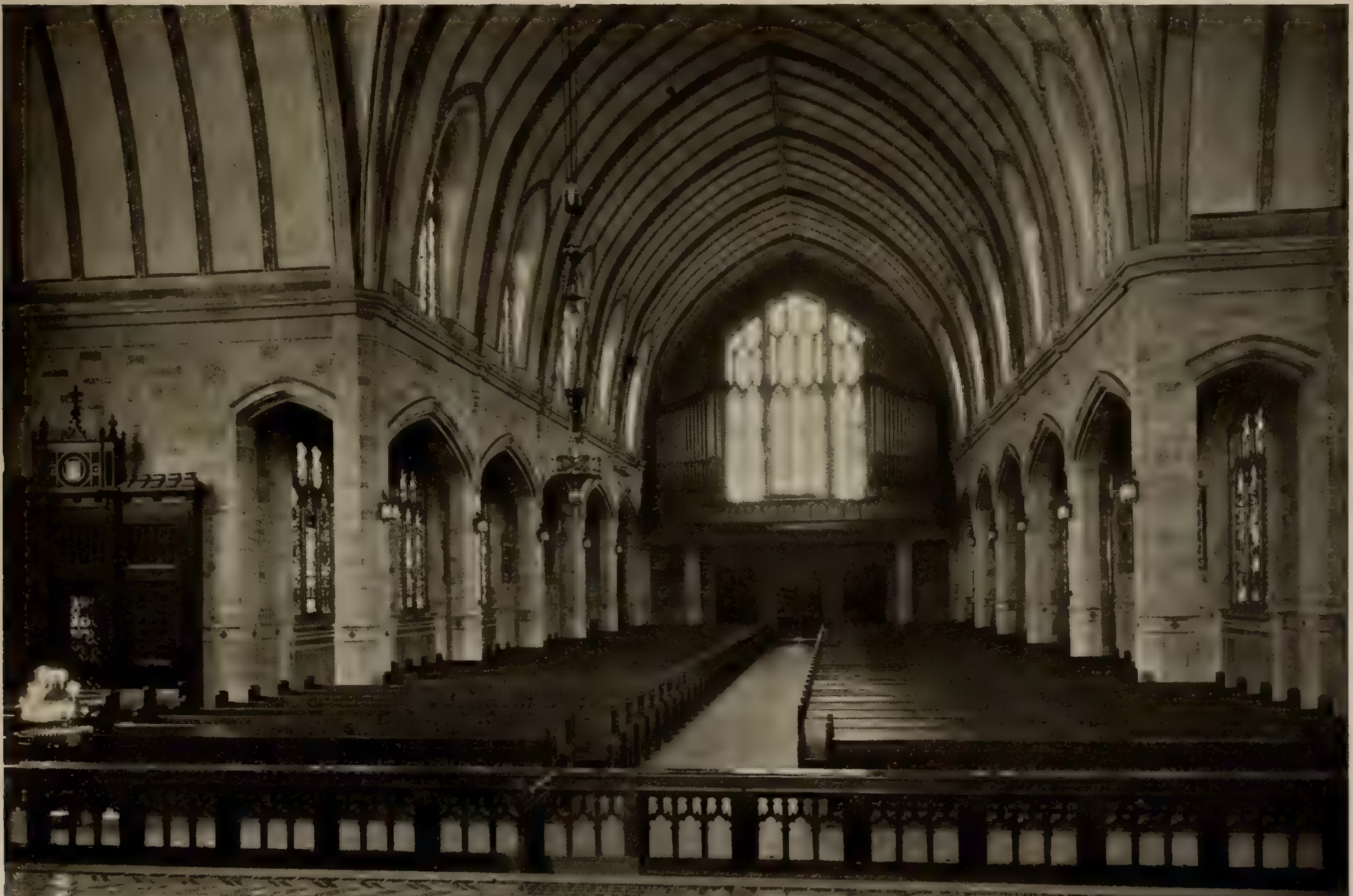


ASILE. Van Leyen, Schilling & Keough, Architects.



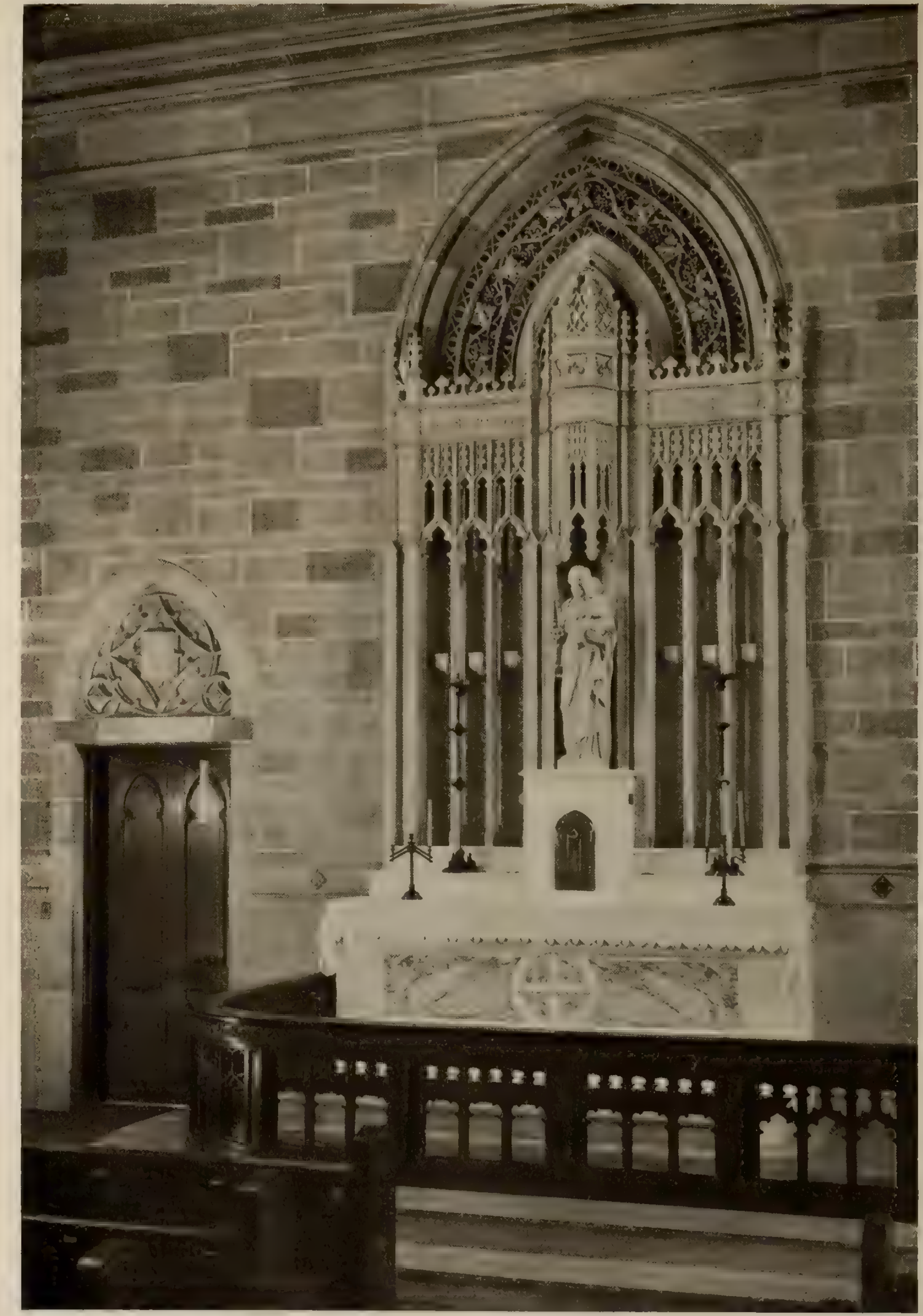
·St·Agnes Church & Rectory·
·Van Leyen·Schilling & Keough·
·Architects & Engineers·Detroit Mich·



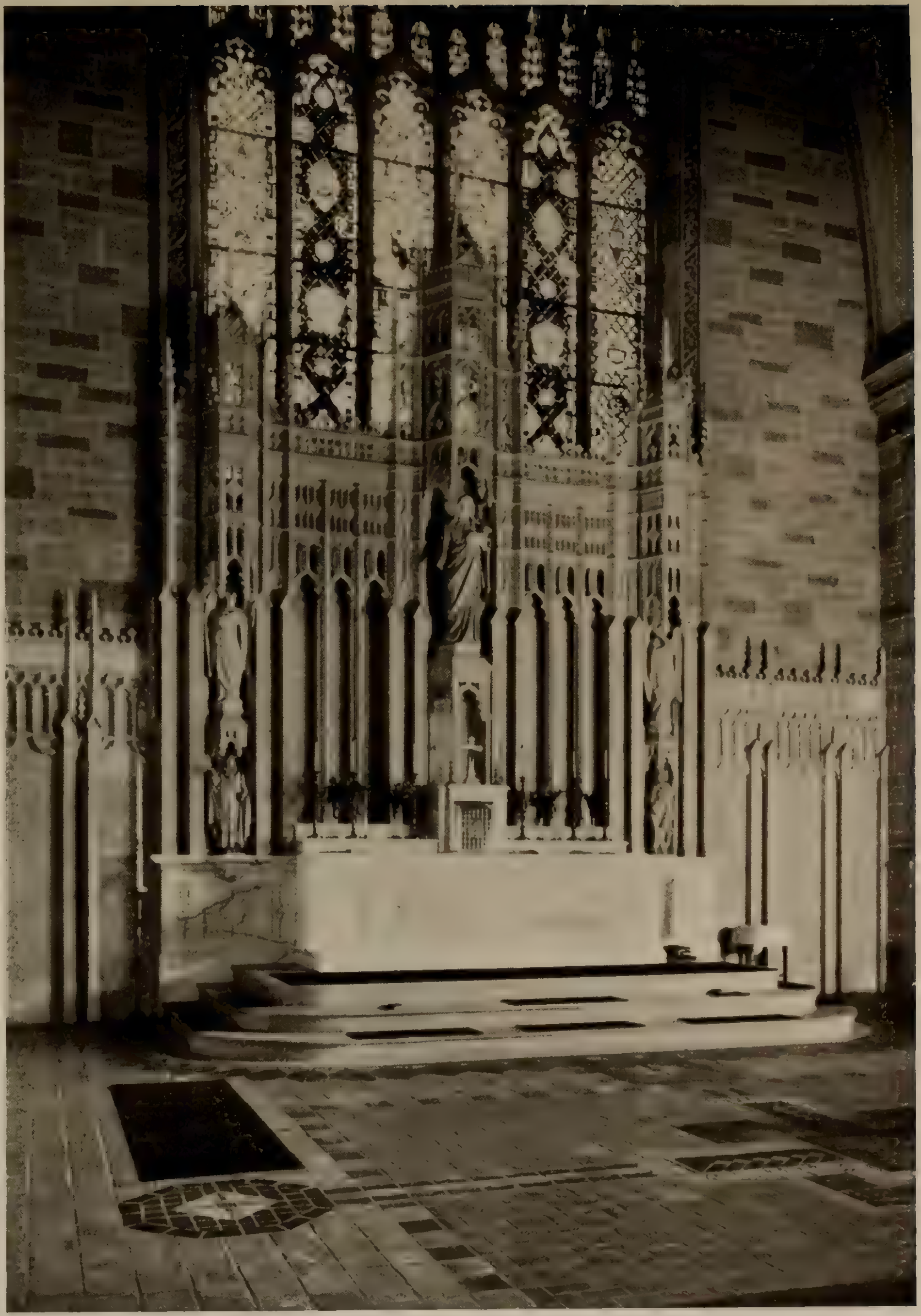


CHURCH AUDITORIUM. Van Leyen, Schilling & Keough, Architects.

ST. AGNES'S CHURCH AND RECTORY, DETROIT, MICH.



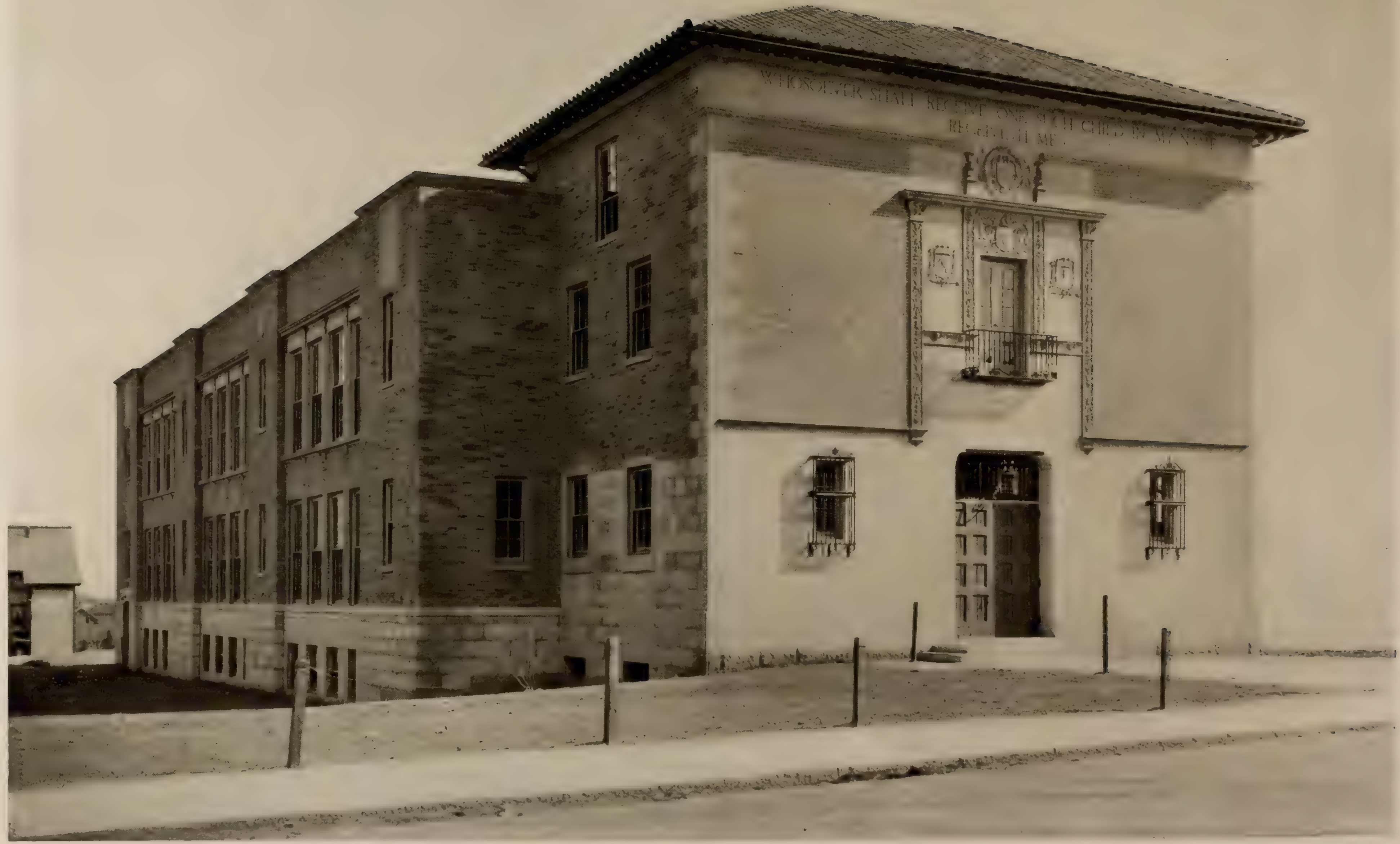
SIDE ALTAR.



MAIN ALTAR.

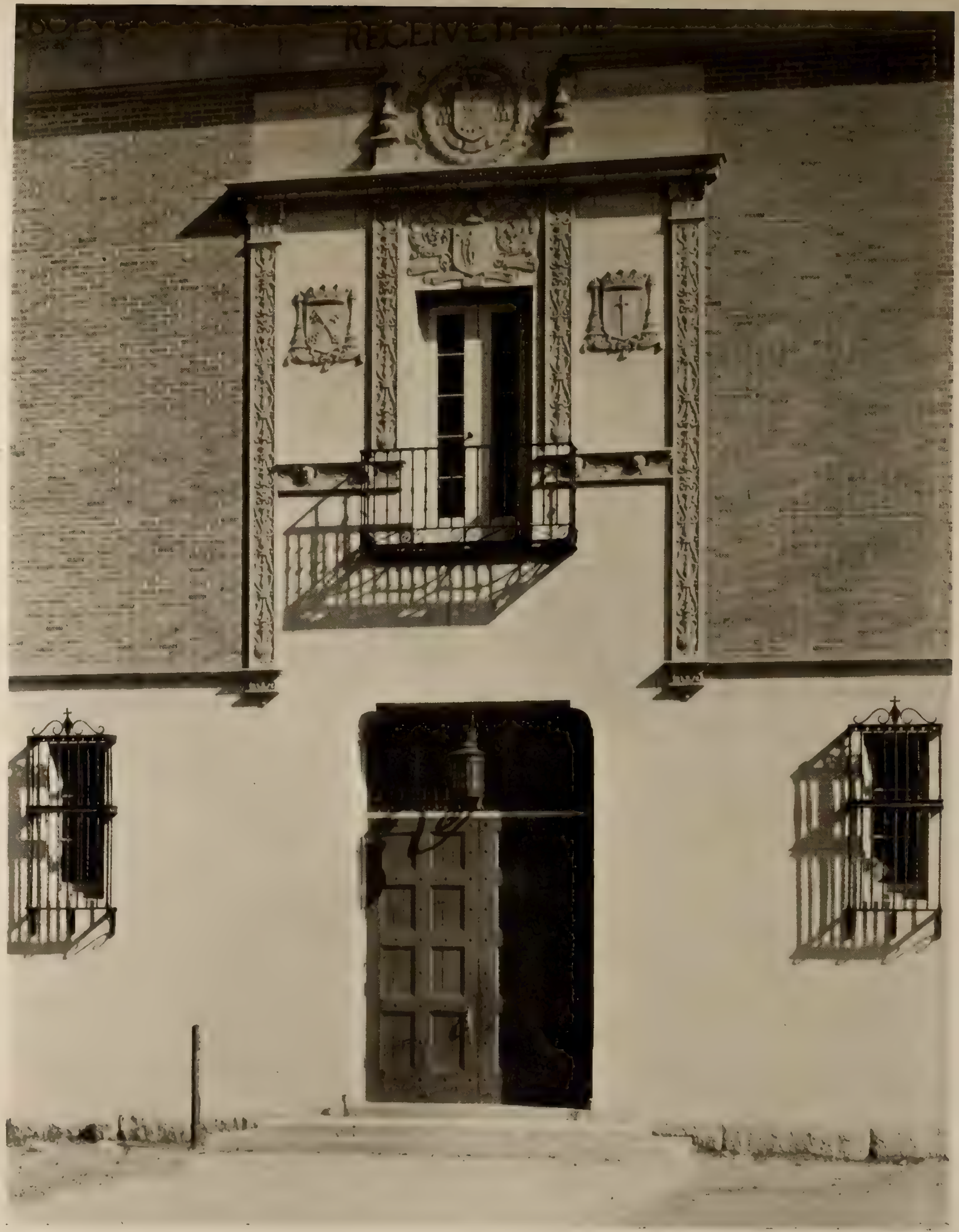
Van Leyen, Schilling & Keough, Architects.

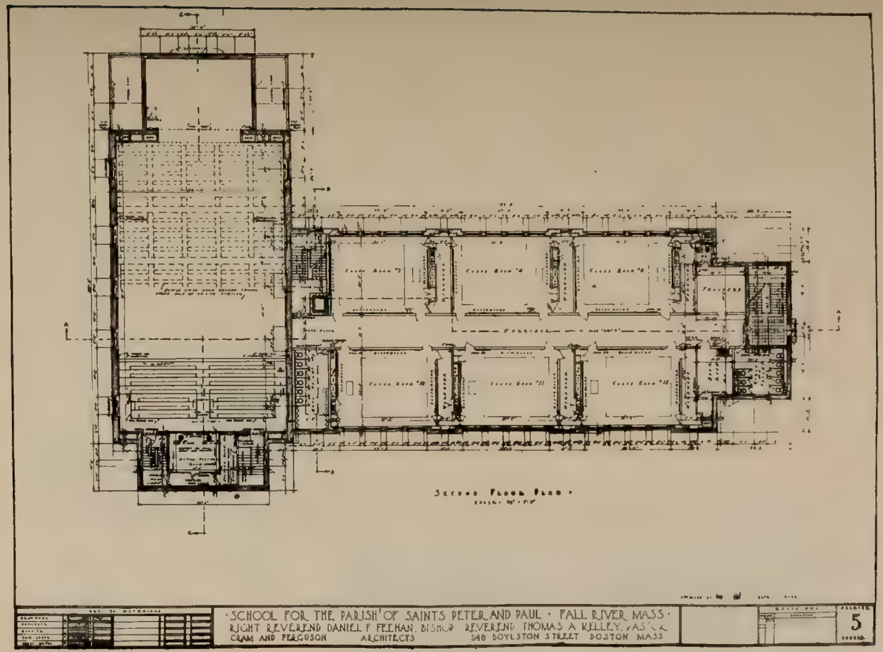
ST. AGNES'S CHURCH AND RECTORY, DETROIT, MICH.

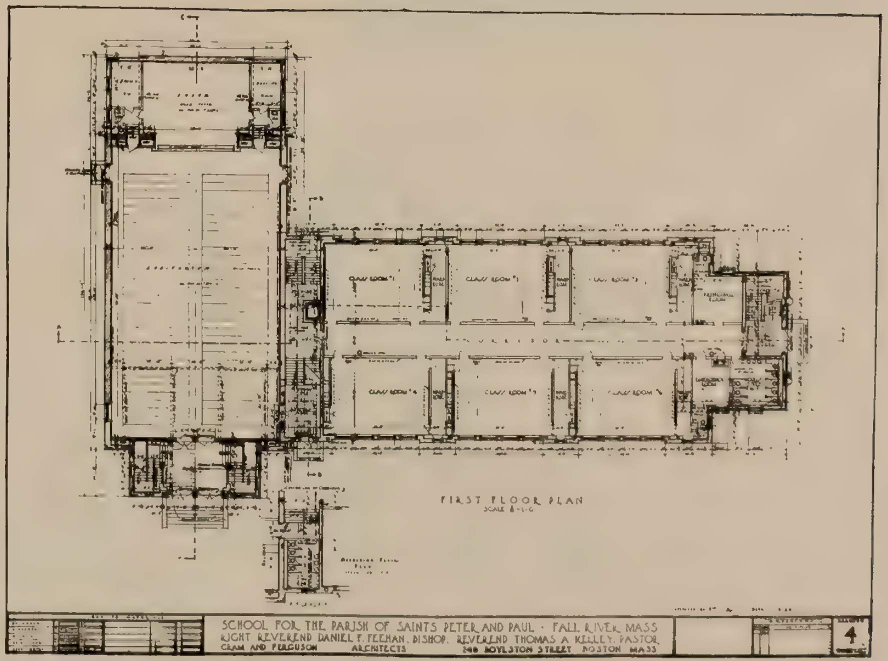


SCHOOL BUILDING FOR THE PARISH OF SAINTS PETER AND PAUL, FALL RIVER, MASS.

Cram & Ferguson, Architects.




SECOND FLOOR PLAN
·SCHOOL FOR THE PARISH OF SAINTS PETER AND PAUL · FALL RIVER MASS·
RIGHT REVEREND DANIEL F FEEHAN. BISHOP REVEREND THOMAS A KELLEY. PASTOR
CRAM AND FERGUSON ARCHITECTS 248 BOYLSTON STREET BOSTON MASS
5


FIRST FLOOR PLAN
SCHOOL FOR THE PARISH OF SAINTS PETER AND PAUL · FALL RIVER MASS
RIGHT REVEREND DANIEL F. FEEHAN. BISHOP. REVEREND THOMAS A KELLEY. PASTOR
CRAM AND FERGUSON ARCHITECTS 248 BOYLSTON STREET BOSTON MASS
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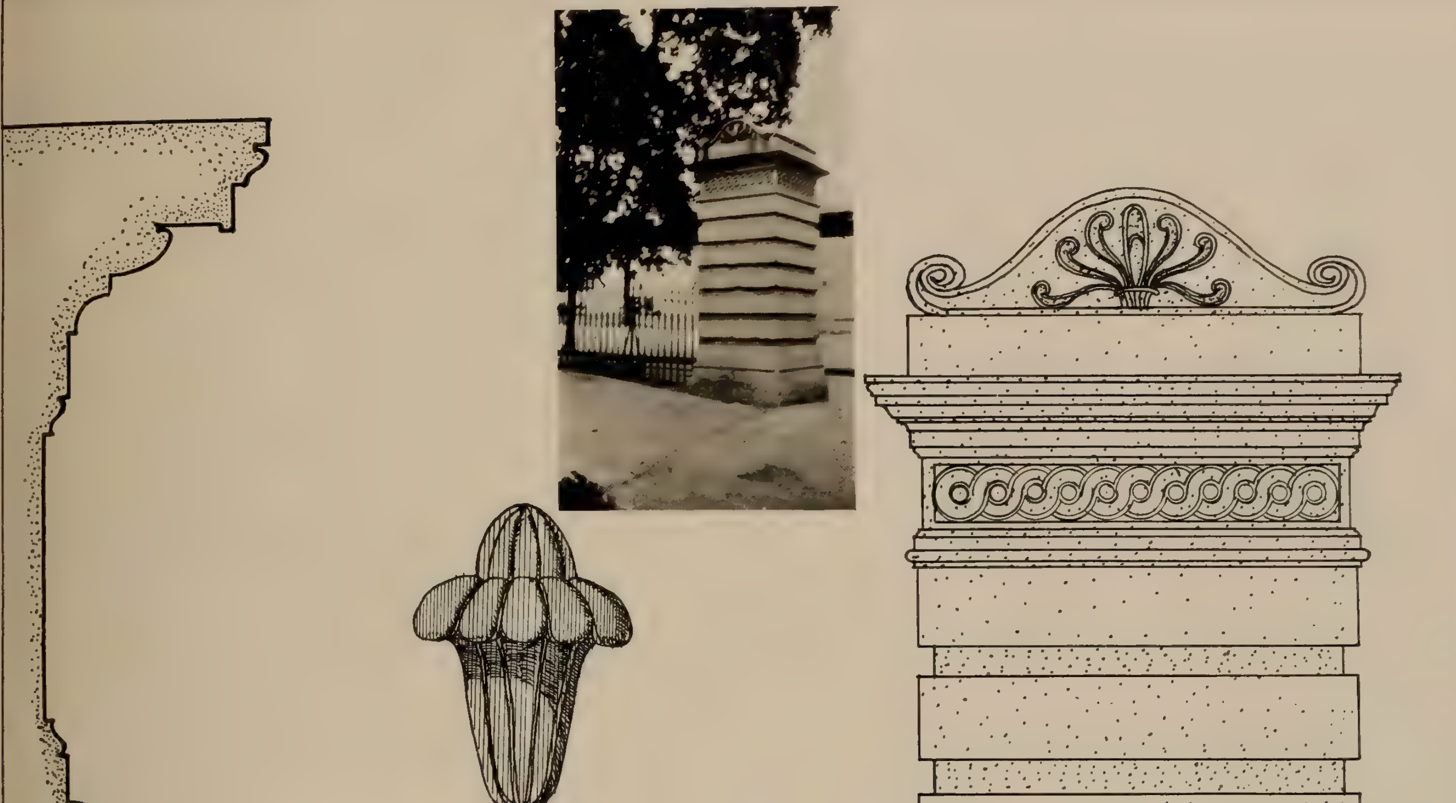
DETAIL, SCHOOL OF THE PARISH OF SAINTS PETER AND PAUL, FALL RIVER, MASS.

Cram & Ferguson, Architects.

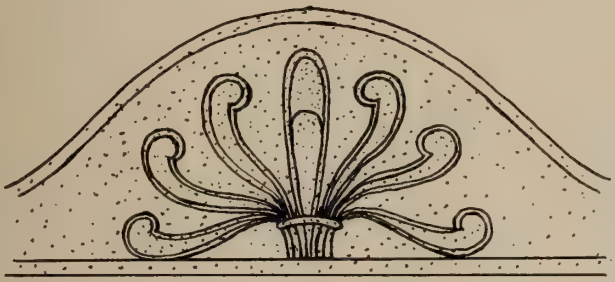


·FRONT · ELEVATION·

EARLY ARCHITECTURE
OF THE
DISTRICT OF COLUMBIA

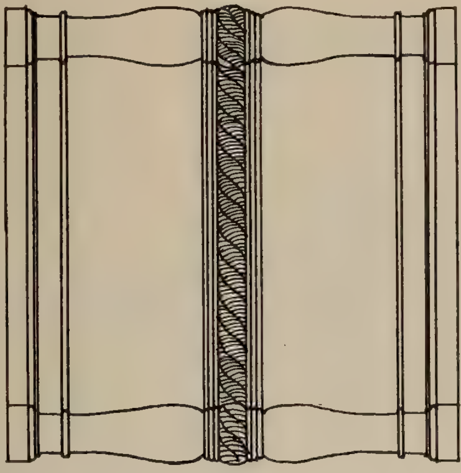
ORIGINAL POSTS & FENCE FROM
-THE U.S. CAPITOL - WASHINGTON, D.C.
·DESIGN ATTRIBUTED TO BULFINCH·
·DATE· CIRCA 1800·

MEASURED, & DRAWN
BY
ALBERT P ERB
WASHINGTON, D.C.

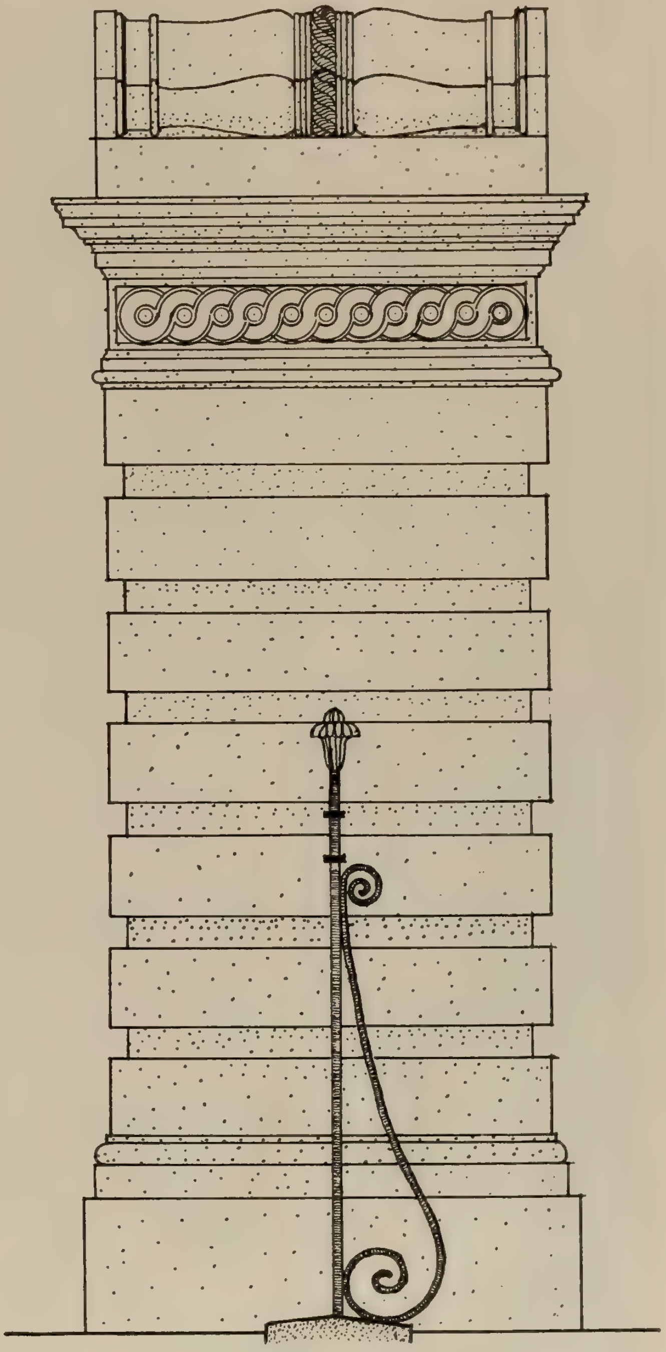


SCROLL ORNAMENT

Scale inches



PLAN OF TOP



SIDE ELEVATION

Scale 12 9 6 3 0 1 2 feet

EARLY ARCHITECTURE
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DISTRICT OF COLUMBIA

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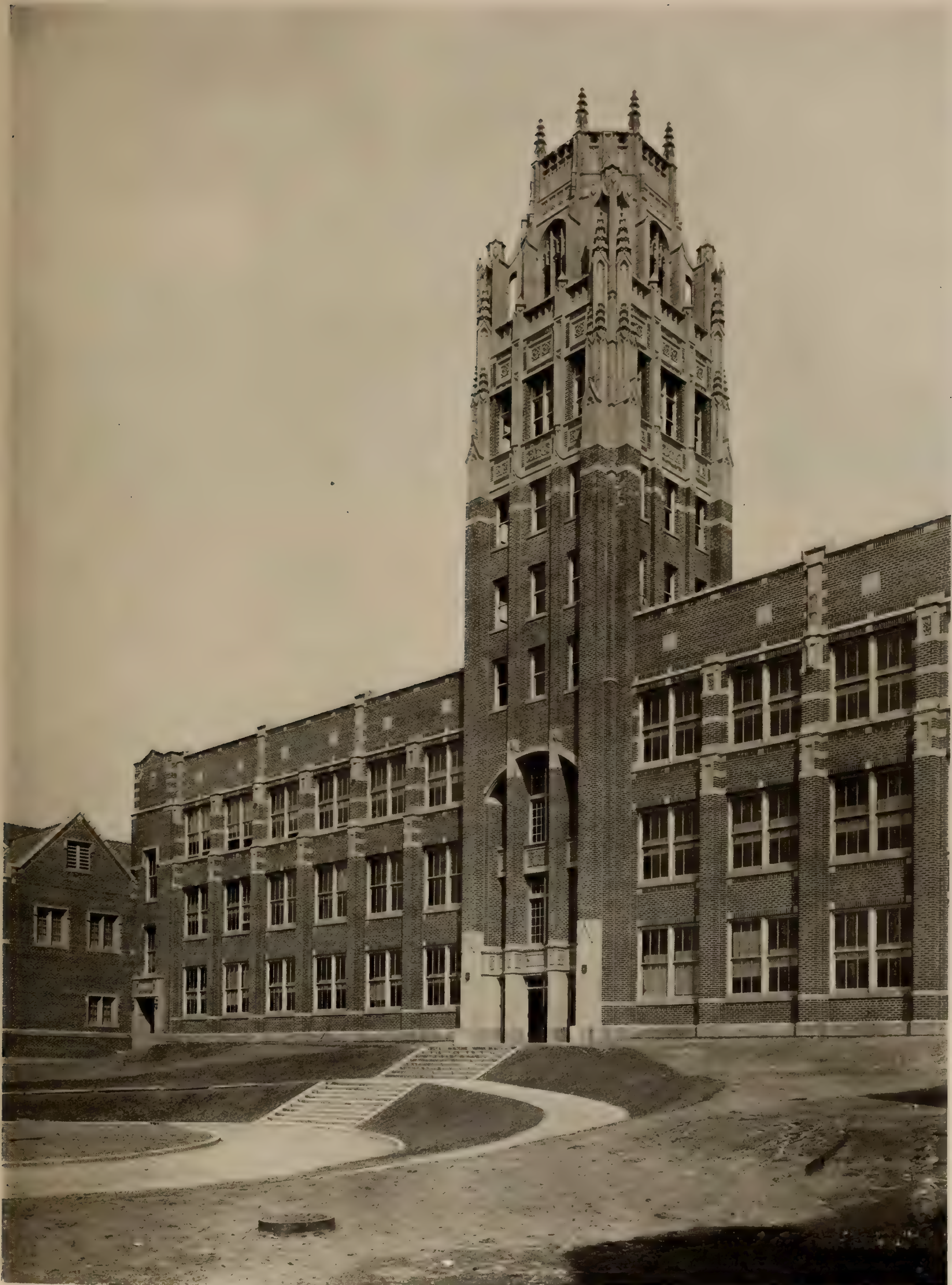
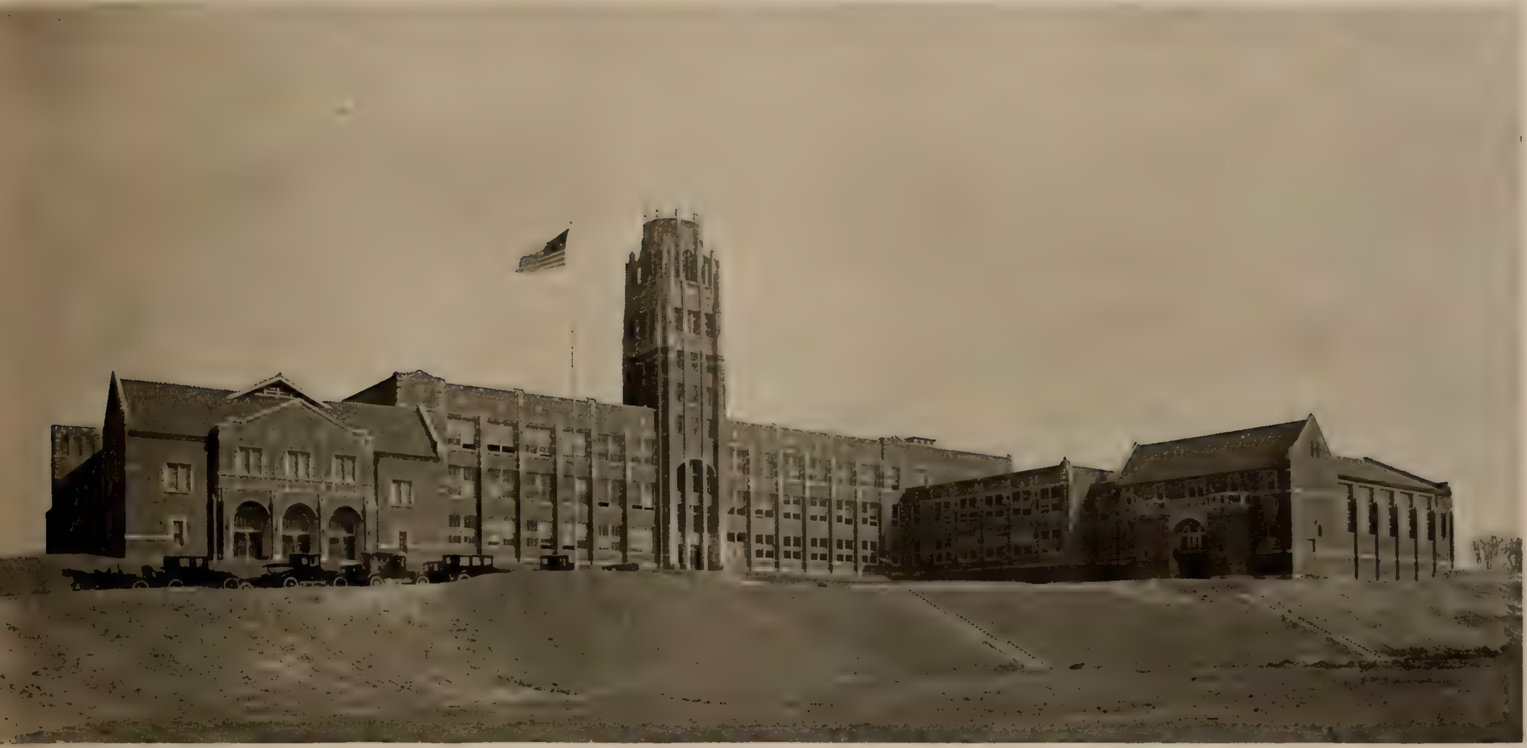
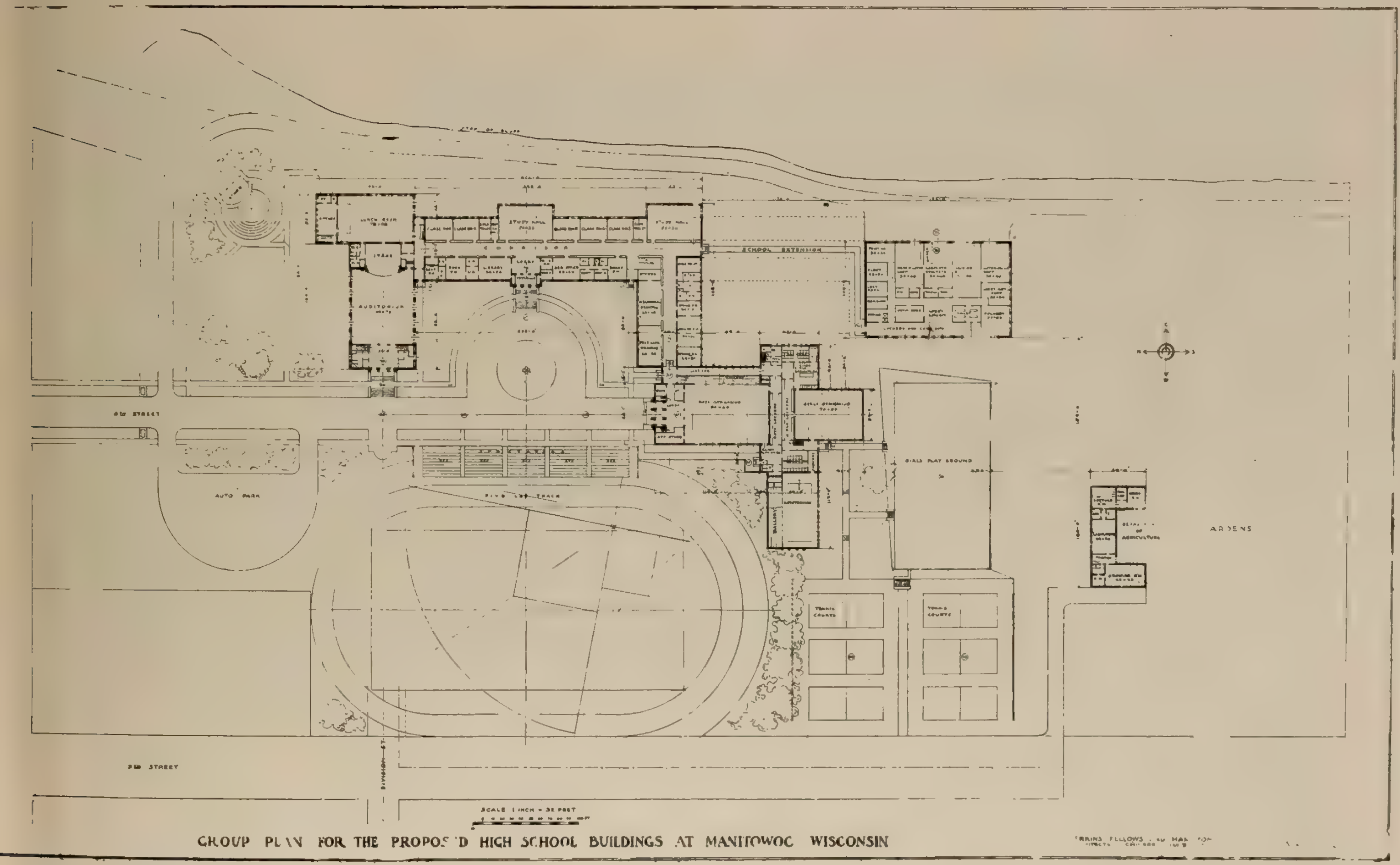


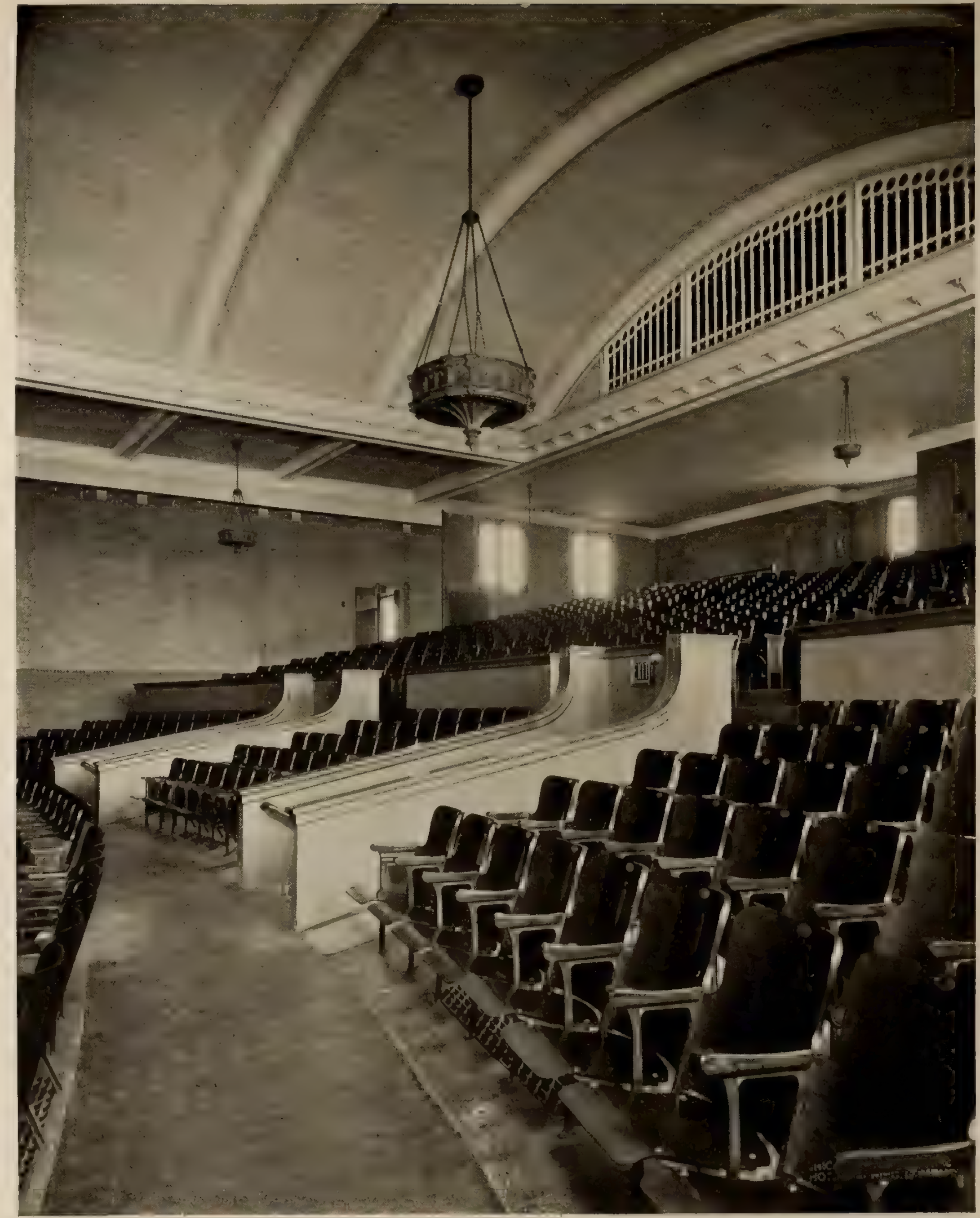
LINCOLN HIGH SCHOOL, MANITOWOC, WIS.

Perkins, Fellows & Hamilton, Architects.

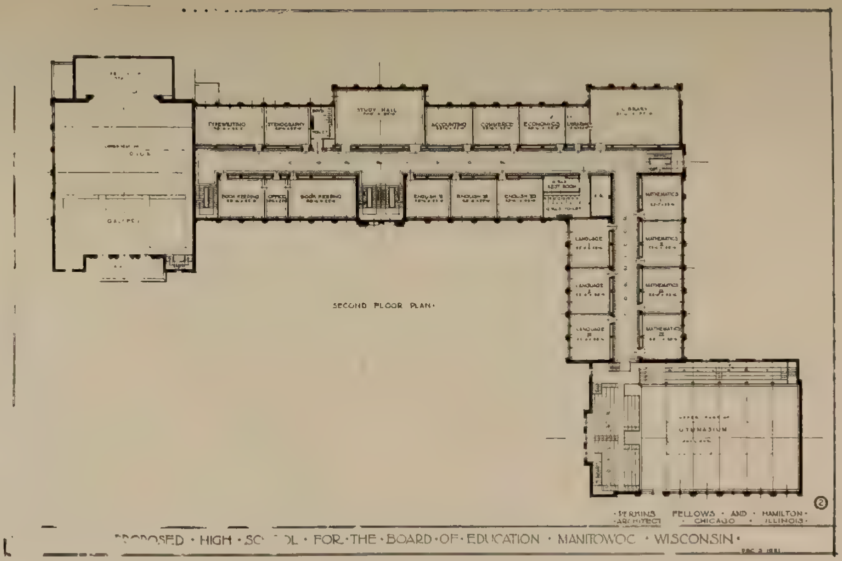


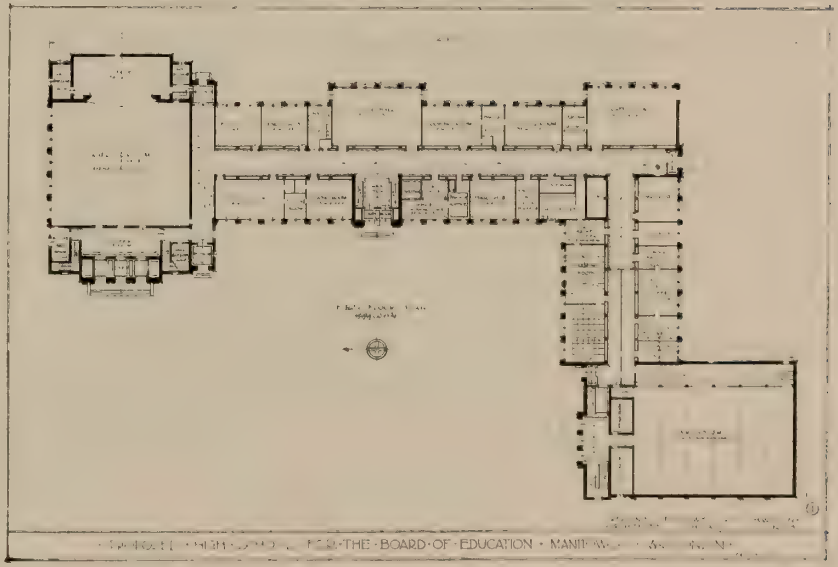


INCOLN HIGH SCHOOL, MANITOWOC, WIS. Perkins, Fellows & Hamilton, Architects.

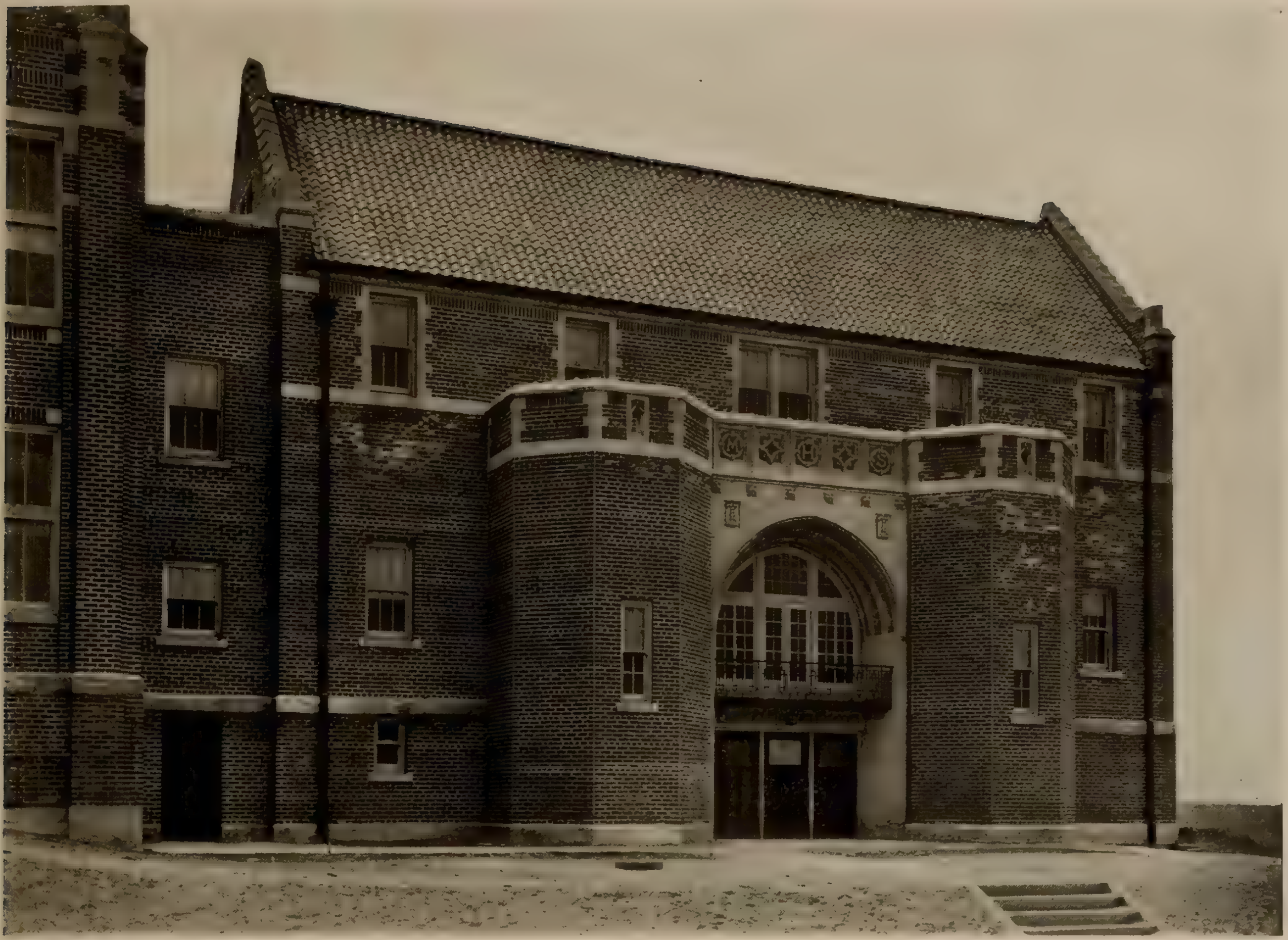


GALLERY IN AUDITORIUM, LINCOLN HIGH SCHOOL, MANITOWOC, WIS.

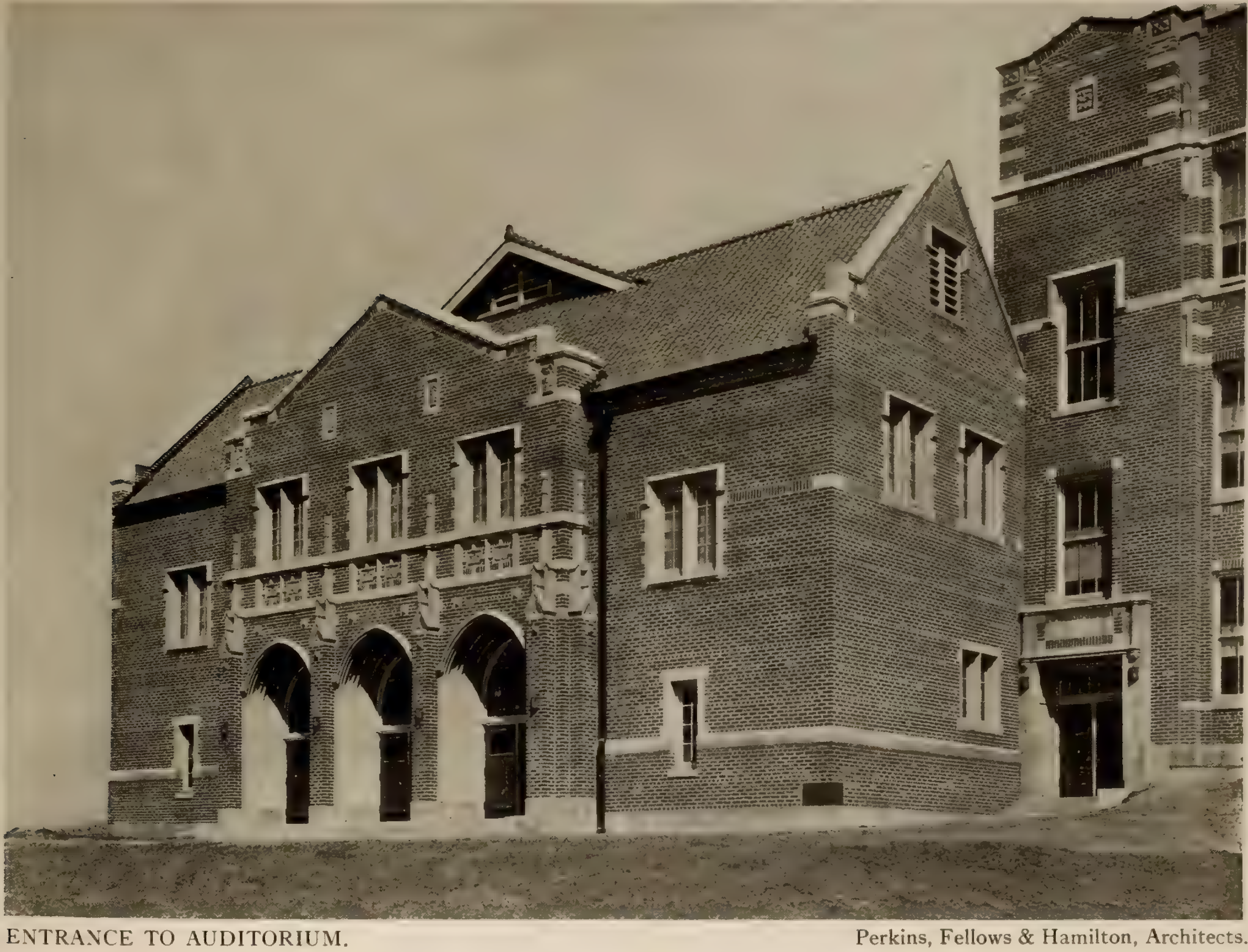




Perkins, Fellows & Hamilton, Architects.

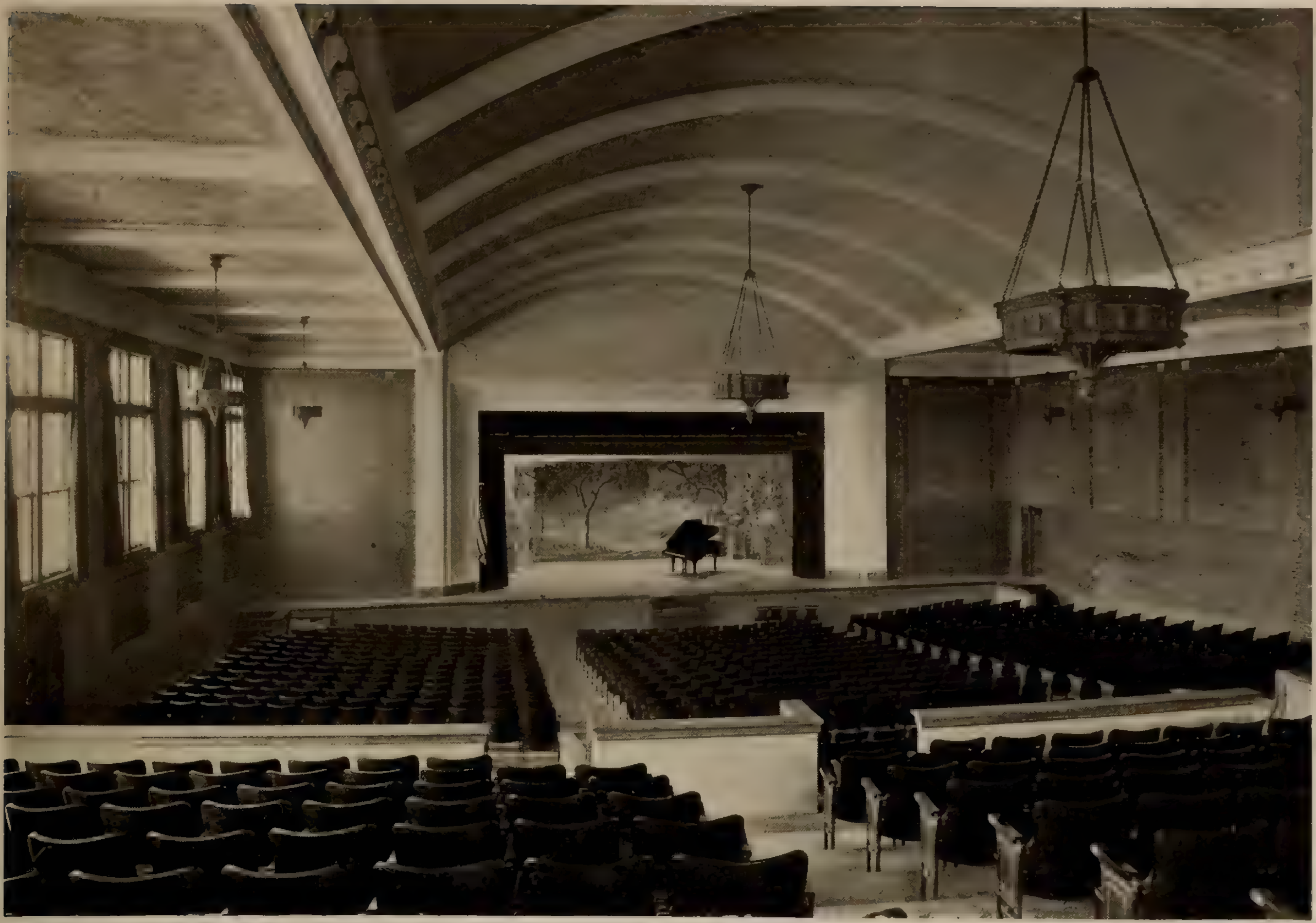


ENTRANCE TO GYMNASIUM.

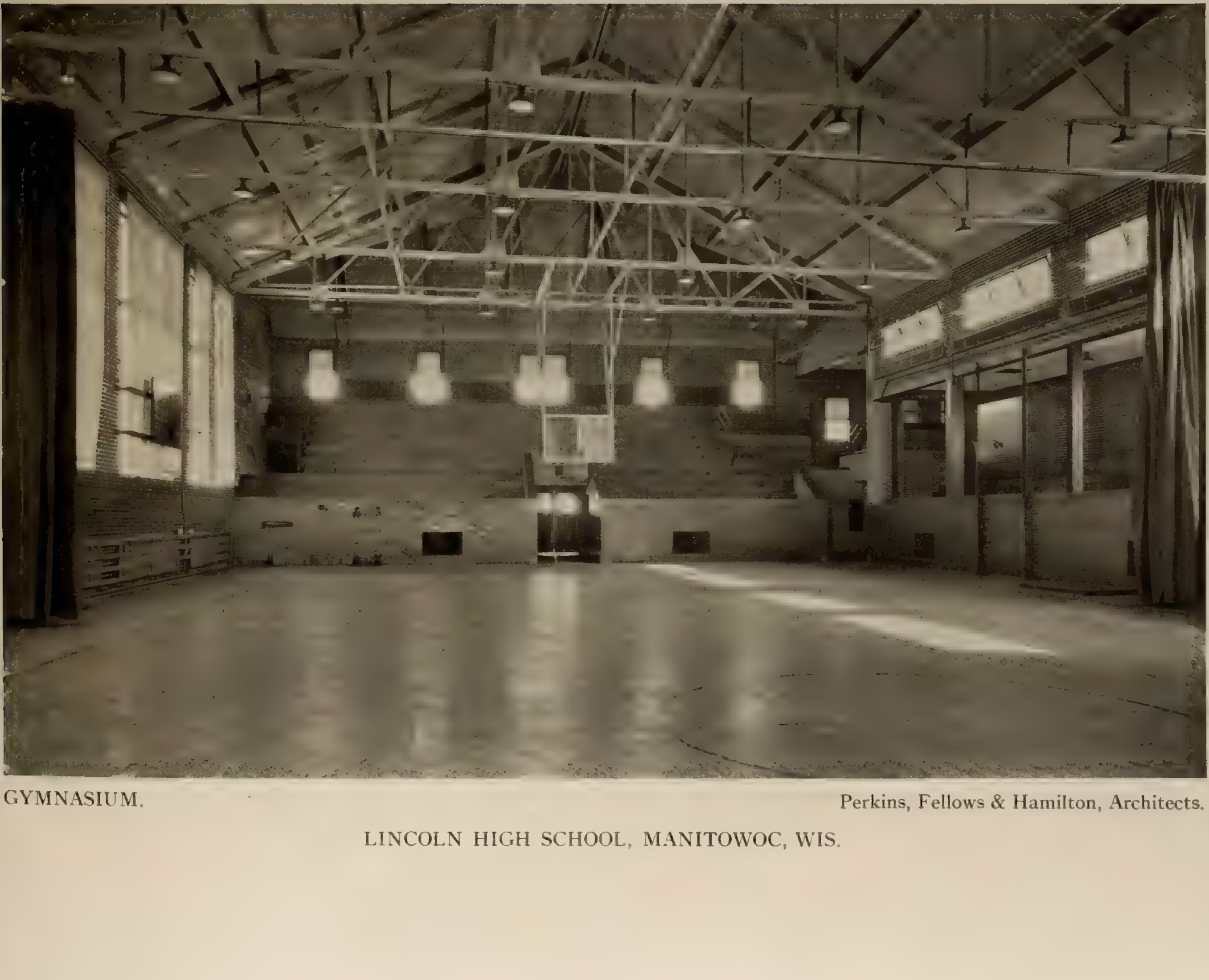


ENTRANCE TO AUDITORIUM. Perkins, Fellows & Hamilton, Architects.

LINCOLN HIGH SCHOOL, MANITOWOC, WIS.



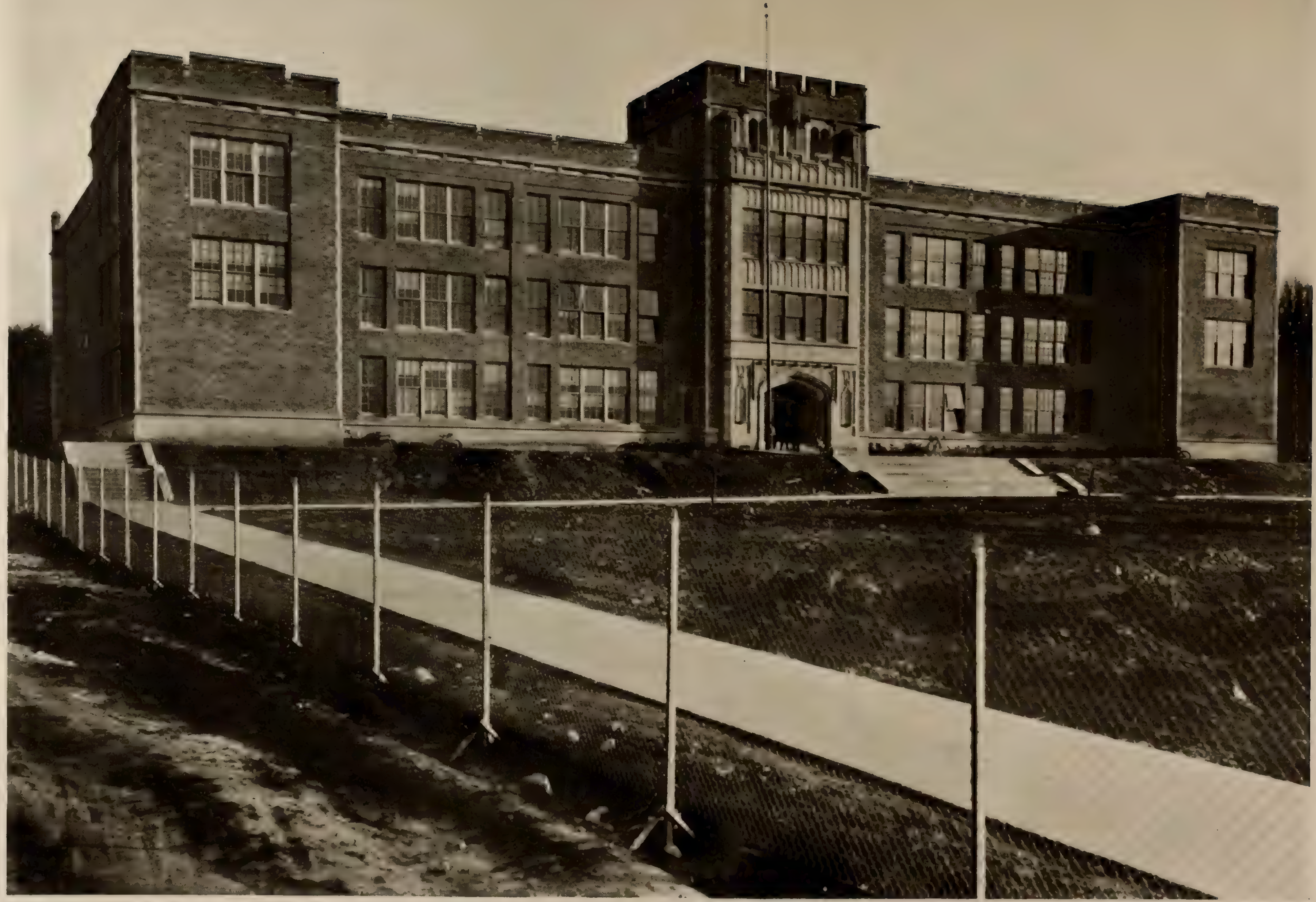
AUDITORIUM, TOWARD STAGE.



GYMNASIUM.

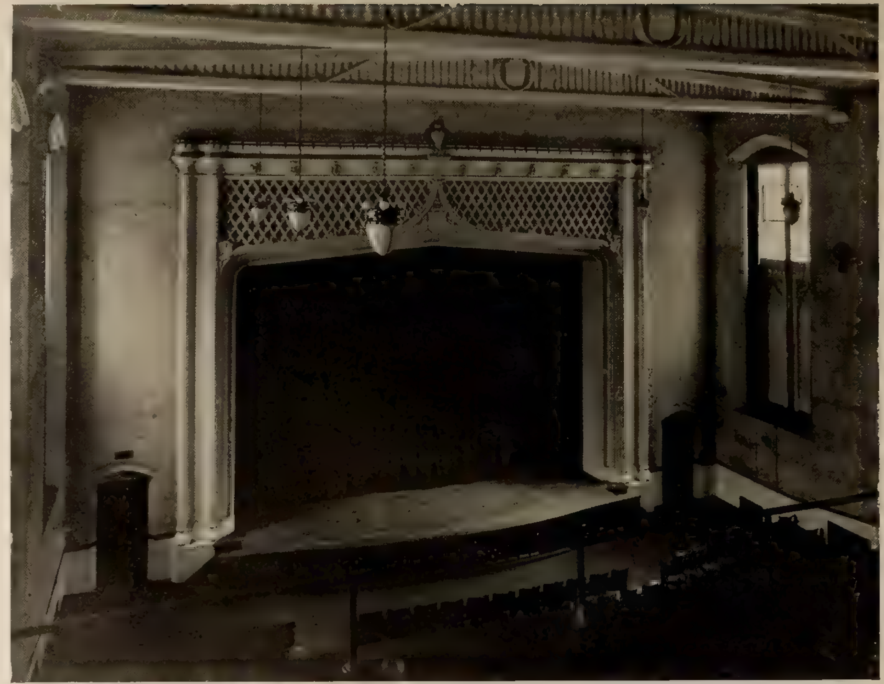
Perkins, Fellows & Hamilton, Architects.

LINCOLN HIGH SCHOOL, MANITOWOC, WIS.

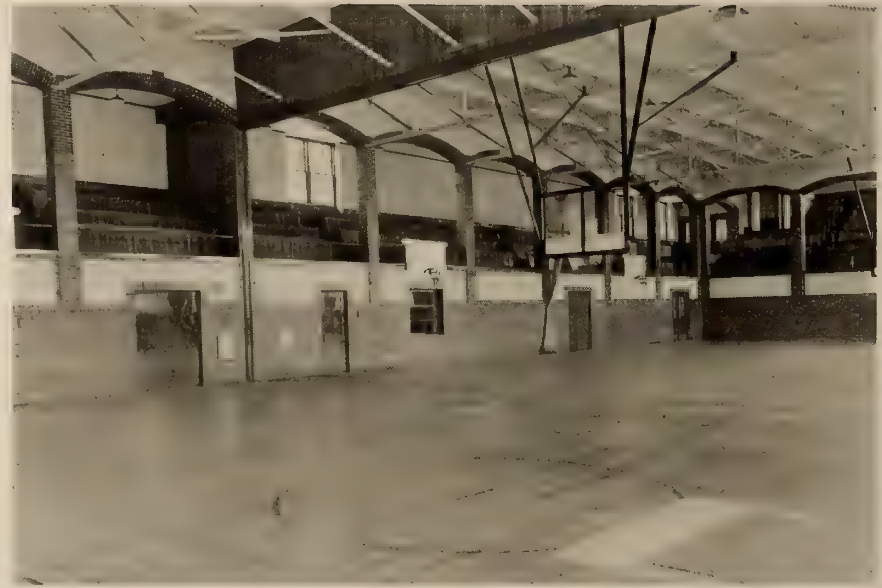


CRESTON JUNIOR HIGH SCHOOL, GRAND RAPIDS, MICH.

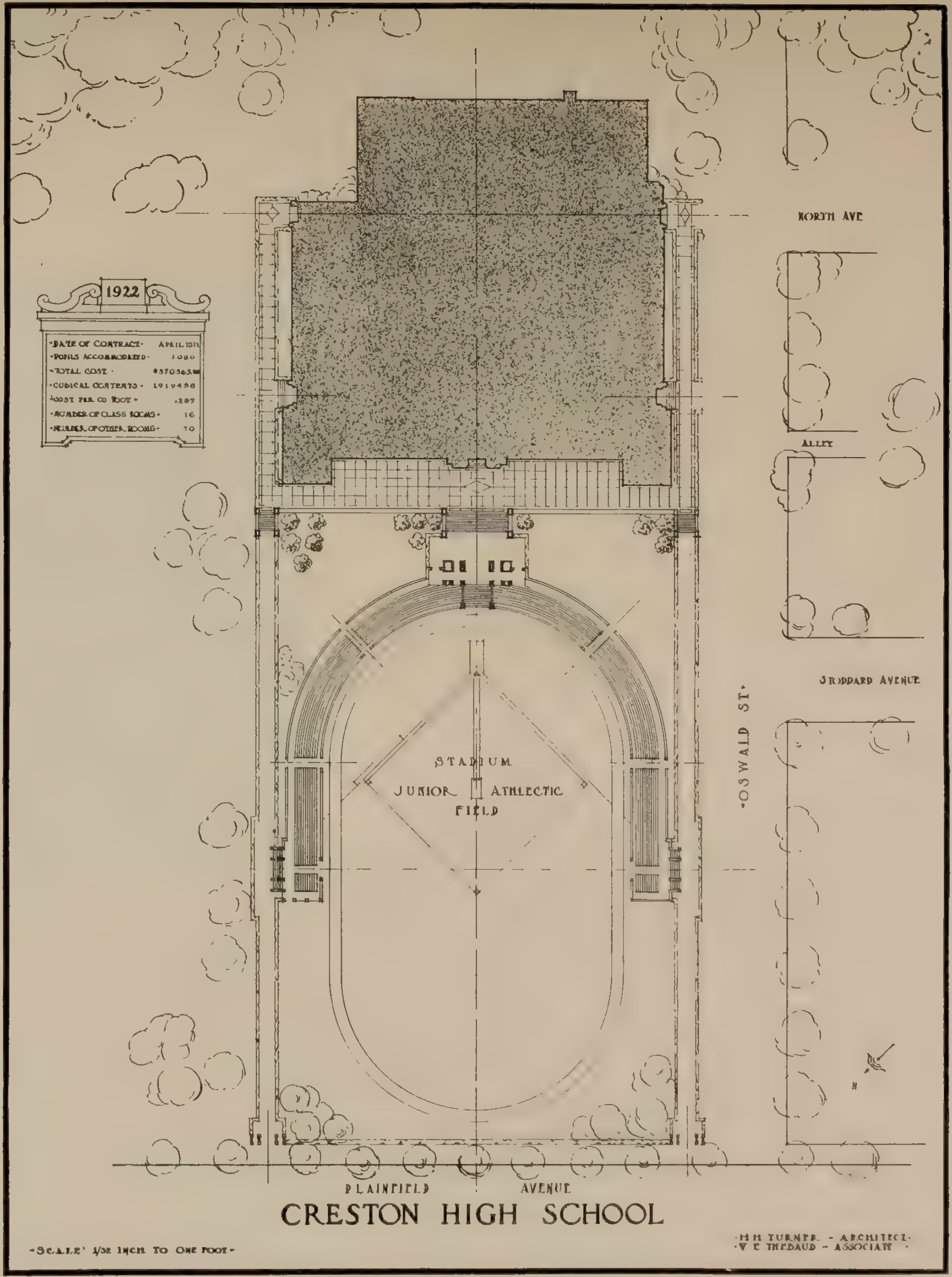
Henry H. Turner and V. E. Thebaud, Architects.



AUDITORIUM STAGE.



GYMNASIUM. H. H. Turner and V. E. Thebaud, Architects.


1922
·DATE OF CONTRACT· APRIL 1921
·PUPILS ACCOMMODATED· 1080
·TOTAL COST· $570565.00
·CUBICAL CONTENTS· 1919458
·COST PER CU FOOT· .297
·NUMBER OF CLASS ROOMS· 16
·NUMBER OF OTHER ROOMS· 70
NORTH AVE
ALLEY
STODDARD AVENUE
·OSWALD ST·
STADIUM
JUNIOR ATHLETIC FIELD
N
PLAINFIELD AVENUE
CRESTON HIGH SCHOOL
·SCALE· 1/32 INCH TO ONE FOOT·
·H H TURNER - ARCHITECT·
·V E THEBAUD - ASSOCIATE·

CRESTON JUNIOR HIGH SCHOOL, GRAND RAPIDS, MICH.

The Creston Junior High School

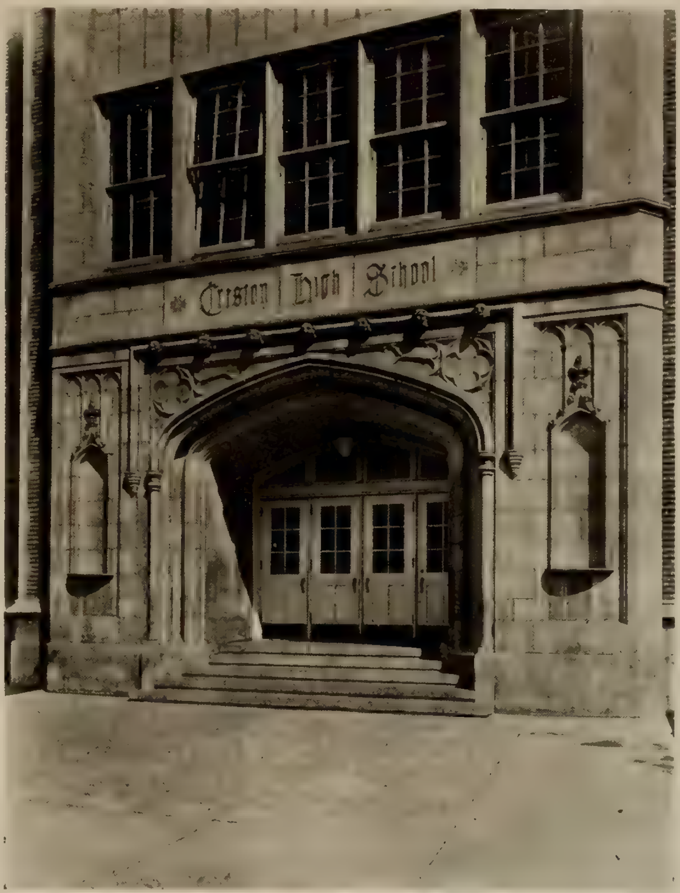
Henry H. Turner and V. E. Thebaud, Architects

THIS building is located in the extreme northern end of the city of Grand Rapids, and is set some 400 feet back from the street line, taking advantage of the peculiarities of the topography in developing the plans.

The building accommodates 720 pupils, but has been planned with the idea in mind of adding classrooms, science-rooms, and shops when the need develops.

Two science laboratories are provided for, with plant-room and aquaria facilities, an apparatus-room, dark-room, and lecture-room. The lecture-room is equipped for projection work.

The commercial-department group of the school consists of a bookkeeping room and a stenographic and dictation room, divided by a double-glazed partition to simplify supervision on the part of the instructor and to isolate the noise of the typewriters.



Main Entrance.

A feature of the commercial department is the banking counter, which functions as the thrift counter of the school as well as for instruction purposes.

A double unit is devoted to the art department, which is divided with a large free-hand-drawing room, and a room for the art-craft work, with adequate storerooms for the care of materials and plate collections.

The department of practical arts for girls is amply provided for in a group of rooms on the top floor in close proximity to the school lunchroom, so that the head of the department of practical arts for girls can also supervise and direct the preparation of the food to be served in the lunchroom.

The school lunchroom affords accommodation for 300 pupils at one sitting, on the cafeteria plan. Ample provision has been made for kitchen, store-room, and dressing-room, with lavatory facilities for kitchen help. An electric elevator carries provisions and supplies from delivery at the ground floor to the lunchroom kitchen on the top floor of the building.

For the boys' industrial arts, space is provided on the ground floor, most of this space being arranged for top lighting.

Provision is made for a comprehensive wood-working shop, metal-working shop, auto mechanics, and electrical shop, printing and bookbinding, and a mechanical-drawing room. In the main, the space for shops is arranged so that the size of the shop units can be readily adjusted to meet the varying needs of the further development of the junior or intermediate high-school idea.

The physical education of the pupils is provided for in two gymnasia, one large gymnasium, 60 feet by 90 feet, and one 45 feet by 60 feet, arranged so that the two can be thrown together on occasion, securing an unobstructed floor space of 60 by 135 feet for competition games between schools. There are shower-baths for boys and girls; lockers, rooms, and quarters for the physical directors arranged in such a manner as to make supervision over the lockers and baths effective. The spectators' galleries for the gymnasia will accommodate 550 to 600 people.

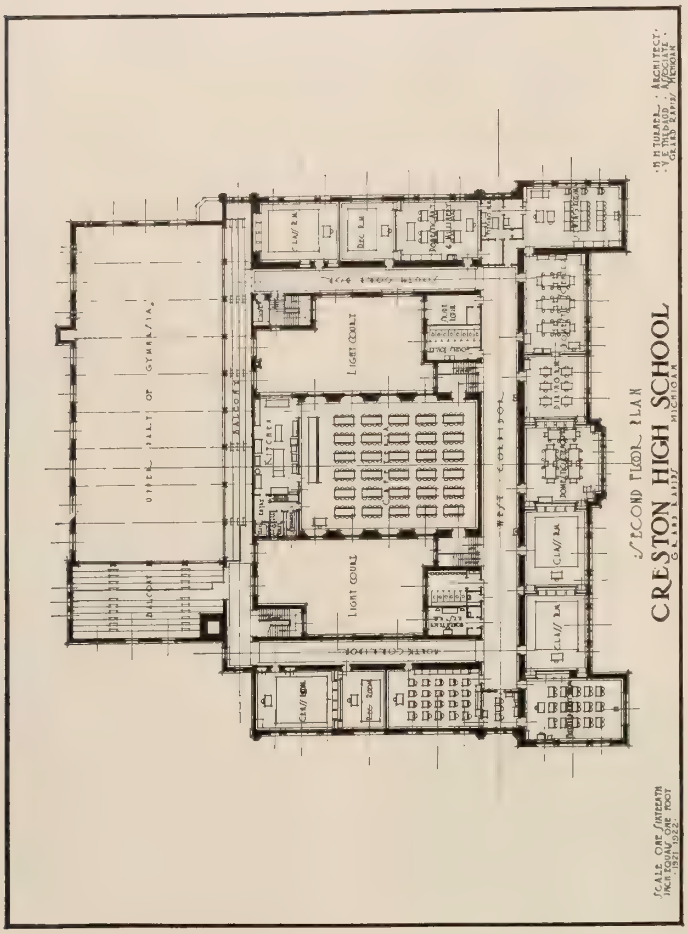
The library consists of two rooms, located on the ground floor adjacent to the main entrance of the building. One of these rooms is equipped as the branch library for this district, with a separate entrance for evening use, so that the library is accessible to the general public as well as the student body. Opening off the branch library is a large room to serve the dual purpose of the reference library, study hall, and upper-grade session room, under the direction of special study teachers.

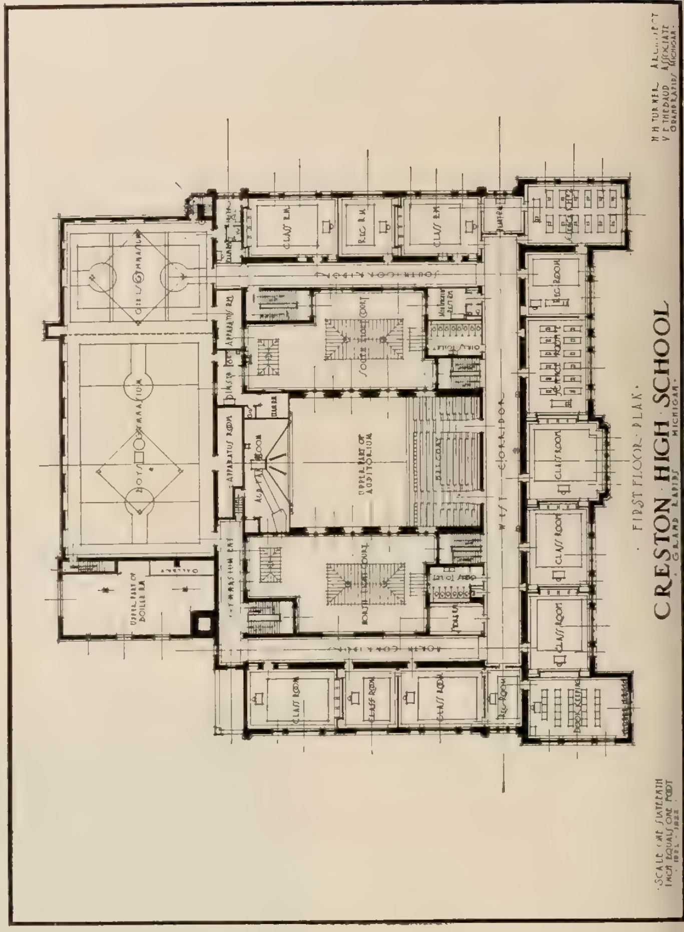
Music and public speaking are arranged for in a large room adjacent to the auditorium stage. This location makes possible the proper correlation of this work with the auditorium facilities for orchestra and chorus work.

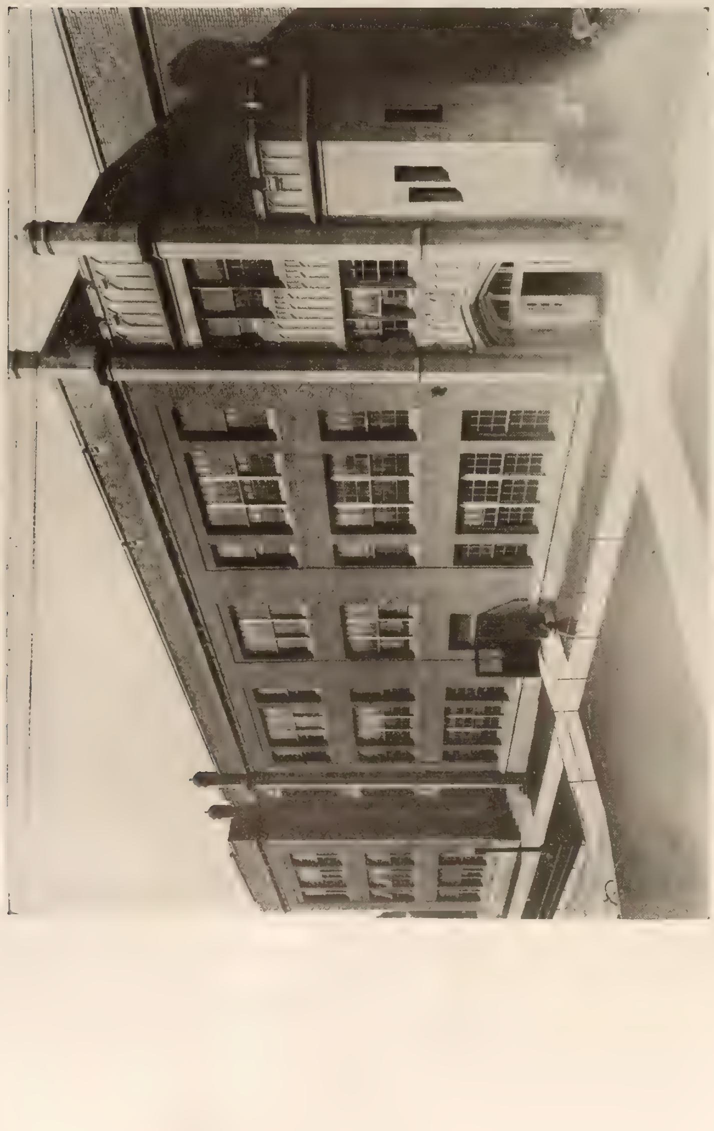
The auditorium has a seating capacity of 800, and is on the ground floor, with a large stage arranged for concerts, school plays, and chorus work. A sloping floor with raised steppings provides adequate sight lines from every seat, and a balcony accessible to the first floor corridor, with a built-in fireproof projection booth, providing a completely appointed auditorium to serve both the needs of the school and the demands of the district for public use.

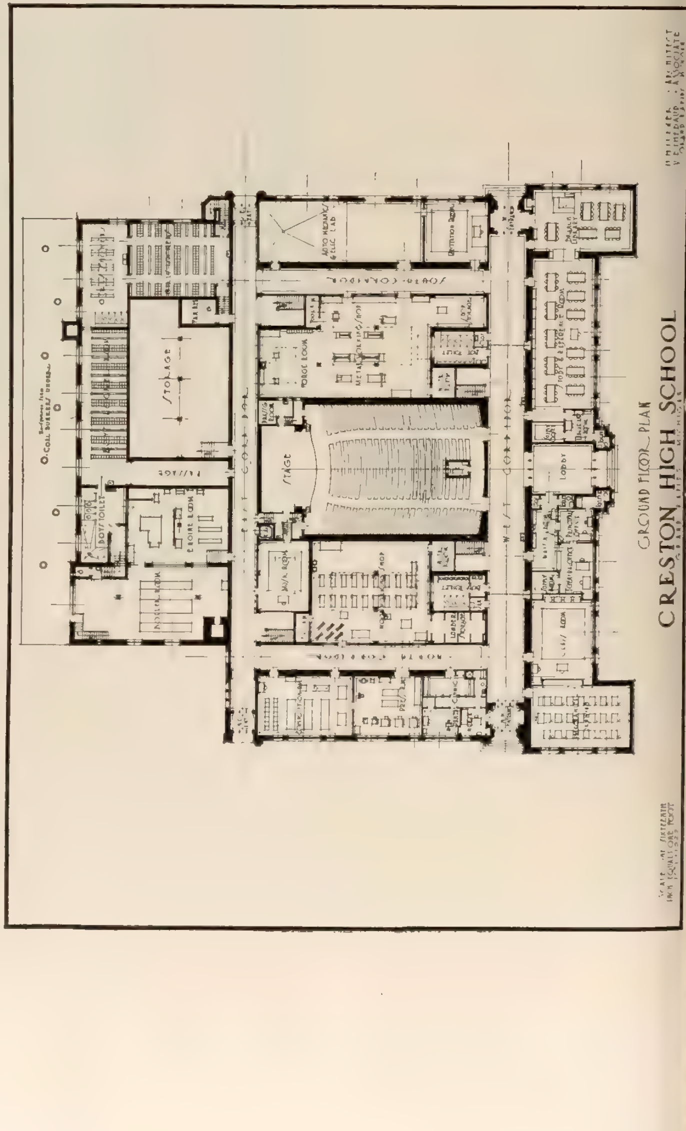
For the administrative quarters, adequate space is allotted in a central location on the ground floor adjacent to the main entrance of the building. Two teachers' rest-rooms, a bookstore, a nurses' room, and a dental-clinic room also have their proper place in the building where they function effectively.

The power and heating plant is located at the southwest of the building, with ample coal-bunker storage under grade for a full season's supply of fuel.


SECOND FLOOR PLAN
CRESTON HIGH SCHOOL
GRAND RAPIDS MICHIGAN
M H TURNER · ARCHITECT ·
V E THEBAUD · ASSOCIATE ·
GRAND RAPIDS MICHIGAN
SCALE ONE SIXTEENTH INCH EQUALS ONE FOOT · 1921 1922 ·
UPPER PART OF GYMNASIUM
BALCONY
LIGHT COURT
LIGHT COURT
WEST CORRIDOR
NORTH CORRIDOR
SOUTH CORRIDOR
CLASS RM
REC. RM


FIRST FLOOR PLAN
CRESTON HIGH SCHOOL
GRAND RAPIDS MICHIGAN
M H TURNER ARCHITECT
V E THEBAUD ASSOCIATE
GRAND RAPIDS MICHIGAN
SCALE ONE SIXTEENTH INCH EQUALS ONE FOOT 1921 1922
GIRLS GYMNASIUM
BOYS GYMNASIUM
UPPER PART OF AUDITORIUM
BALCONY
SOUTH LIGHT COURT
NORTH LIGHT COURT
WEST CORRIDOR
NORTH CORRIDOR
SOUTH CORRIDOR
APPARATUS ROOM
UPPER PART OF BOILER RM
CLASS ROOM
REC. RM




GROUND FLOOR PLAN
CRESTON HIGH SCHOOL
GRAND RAPIDS MICHIGAN
M H TURNER · ARCHITECT
V E THEBAUD · ASSOCIATE
GRAND RAPIDS MICHIGAN
SCALE ONE SIXTEENTH INCH EQUALS ONE FOOT 1921 1922
COAL BUNKERS
STORAGE
BOILER ROOM
STAGE
FORGE ROOM
LUNCH ROOM
WEST CORRIDOR
EAST CORRIDOR
NORTH CORRIDOR
SOUTH CORRIDOR
LOBBY
AUTO MECHANICS & ELEC. LAB

General view of intake and ship canal.

Electricity and the Architect

By H. P. Allen

THE architect is more than a builder. He is a creator of symbols. As such he must express in his structures the progress of the race. Not only must they serve the purposes for which they are built, but also embody the idea underlying their use.

No force in the making to-day offers more of a challenge to the builder than electricity, the new young giant, which has developed from a remote scientific wonder to everybody's servant in less than half a century. To house the ponderous machines which provide current for industry and the home in buildings that spell power has been the task of the architect in the evolution of the new force. As to how well he has succeeded, the sightly structures which have so largely replaced the shedlike central stations of yesterday will testify.

Fairly typical of the new order is the Chippawa-Queenston development of the Hydro Electric Power Commission of Ontario at Niagara Falls. This plant, which will have a generating capacity in excess of 600,000 horse-power, impresses not only by the daring of the plan behind it, but by its simple, massive lines. They lend beauty to a utilitarian structure. Here is a building that embodies the idea of power, just as the pyramids and the Sphynx symbolize the mysteries of ancient Egypt.

The Chippawa-Queenston development is the largest hydroelectric plant at Niagara Falls; when completed, it will be the largest in the world. At present, when it is furnishing about 330,000 horse-power, it has but one rival for size, a hydroelectric power-house in Sweden having a capacity of 400,000 horse-power.

The idea behind the new development was to get the last available horse-power from the water allotted to Canada under the treaty with the United States for limiting diversion of water at Niagara and preserving the beauty of the cataract. There is a difference of 327 feet between the levels of Lakes Erie and Ontario. The new development uses 305 feet of this as the available head for the first units installed, and 309 for the rest, which will enable the capacity of the generators to be increased in the newer installations. The other hydroelectric plants at the Falls use but 130 to 210 feet of head. This means that although the Chippawa-Queenston development has cost the people of Ontario more than $70,000,000 to date, it will spell economy in the end. Water, for power purposes, is going to be more precious as the years pass by.

To make the development possible, the current of the sluggish little Welland River, which joins the Niagara about a mile above the Canadian falls, has been made to flow the other way than nature intended for about four miles; a whole countryside has been turned upside down to build a canal eight and one-half miles long, and the majestic Niagara cliff pressed into service.

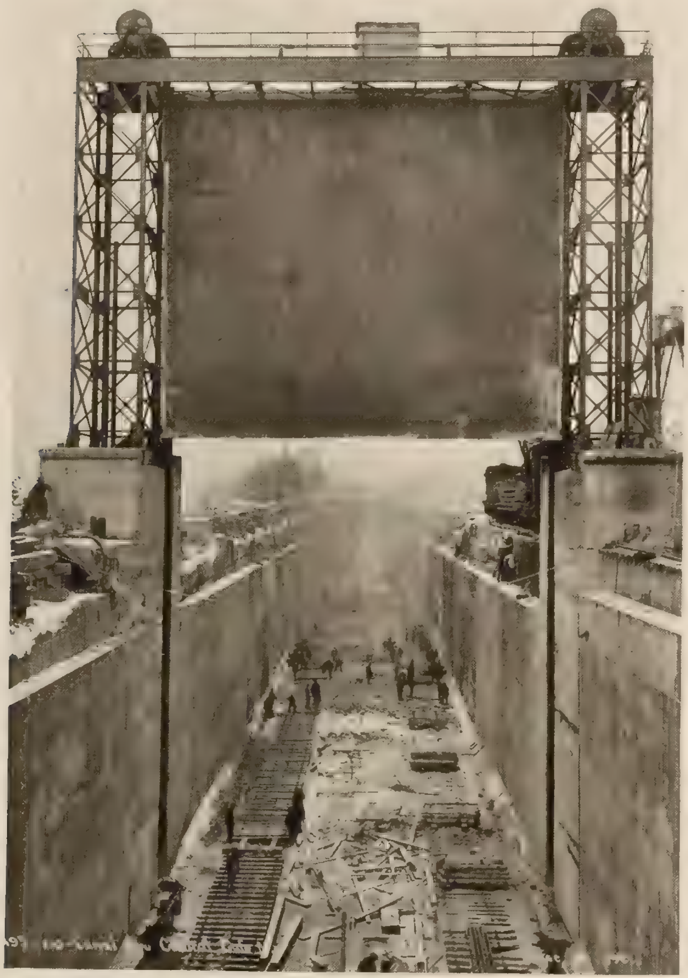
It cannot be said, even by the hypercritical, that the new power-house detracts to any great extent from the beauty of the Niagara gorge. Somehow the building fits, even to the concrete-covered penstocks and the steel towers which carry the high-tension wires over the edge of the cliff.

Crowning the Niagara escarpment about a mile from the General Brock monument is the screen-house, marking the terminus of the twelve-mile canal. It is a long, narrow building, done in the pleasing style now common to the newer power-houses—tall windows, rounded at the top, straight lines everywhere else, and a paucity of ornamentation. The architect has achieved here, with a few simple lines, an effect that gets away from monotonous squareness to a remarkable degree.

The power plant itself, where turbines and generators are located, together with the giant transformers and a bewildering array of auxiliary machinery, is at the foot of the cliff. It is carried out in the same pleasing architectural lines as the screen-house. It is a stupendous hieroglyph of the resistless power of the forces of nature, tamed and made subject to the uses of man. It is an embodiment of the dynamic spirit of a new age, born in a New World and worked out in a new way with new materials.

When completed the power-house will be 700 feet long. Its height is 160 feet, or slightly less than that of the Horseshoe Falls. It will house ten vertical alternating-current generators, varying in capacity from 55,000 to 70,000 horse-power, directly connected to single-runner turbines. Although these machines are towering structures, as dynamos go, standing 26 feet 10 inches above the generator floor, it is not so much the size of them that requires so large a building to house the power plant as the tremendous amount of

General view.



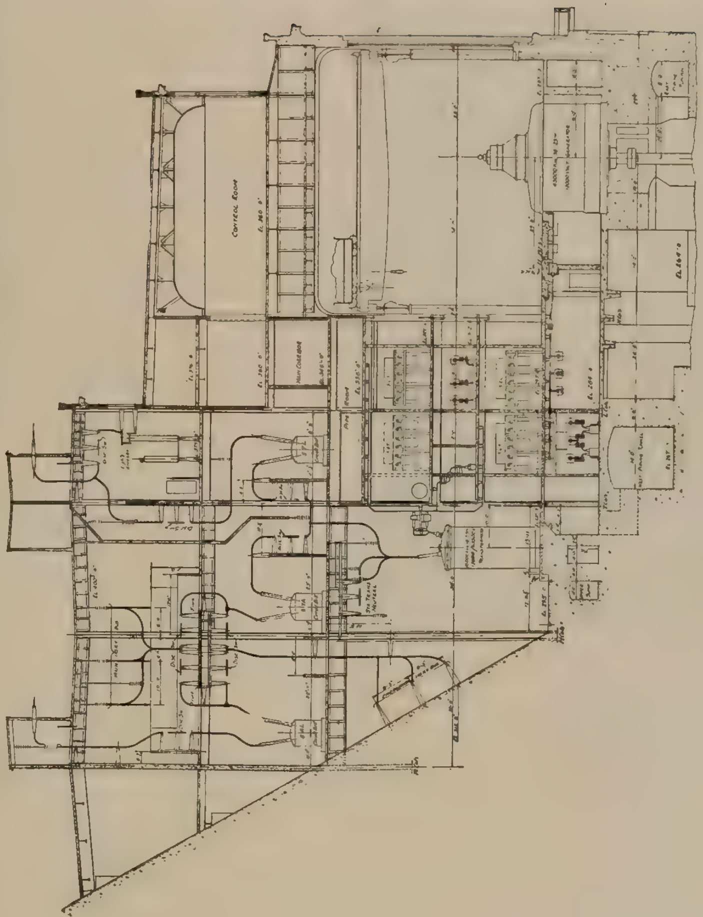
Canal through central gate.

1920
310-BRIDGES-404-Paving Completed-looking N under M.C.R.-G.T.R. Bridge. Oct 8 1921.

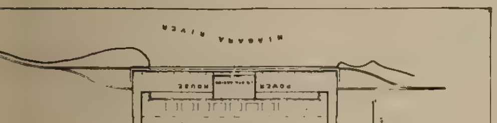
auxiliary machinery needed. In addition, room is provided for elevators, hospital, kitchen and dining-room, and various offices and storerooms. To supply current for the auxiliary machinery a 2,800 horse-power dynamo is required. Two of these machines are in place, and they are no small affairs, though they look like toys beside the big units. One of the auxiliary dynamos would supply the ordinary electric needs of a town of 10,000 people.

The 55,000-horse-power generators extend through three floor levels of the power-house. Thrust bearings, supporting frames, and the direct-current exciting dynamos show above the main floor. On the next floor below are the stator-frames and coils, with the ponderous rotors inside. The next floor below gives a view of the rotors. The huge guide bearings which keep the 30-inch shafts from swinging from side to side are on this level. The turbines are on yet another floor below, beneath which are sump pits.

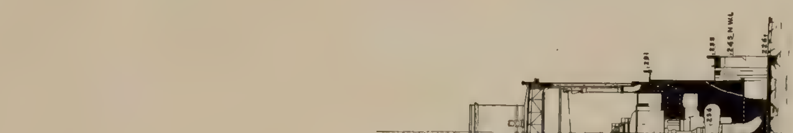
Above the main floor are several levels devoted to transformers, oil switches, offices, and the like, although the space immediately above the big generators rises clear to the roof and serves as a craneway. The switchboards, from which the generators and turbines are controlled, are on the top floor. The control of six machines centres in one room, with only two operators required on watch. Their instruments tell them everything that is going on as the big dynamos run, even to the temperature of the coils.



Section power house.

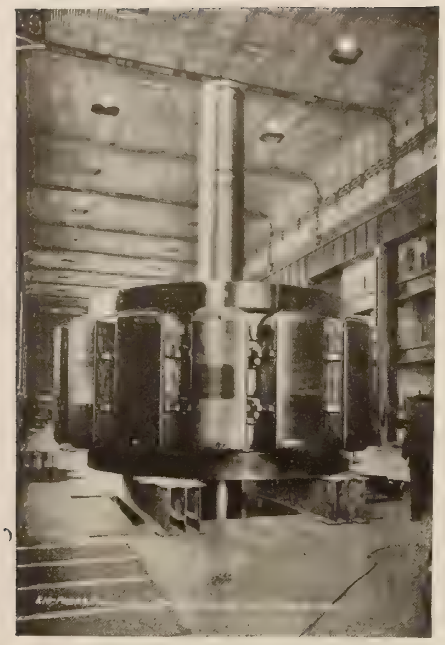


General plan of development.



Cross section screen house and power house.

HYDRO-ELECTRIC PLANT, NIAGARA FALLS.



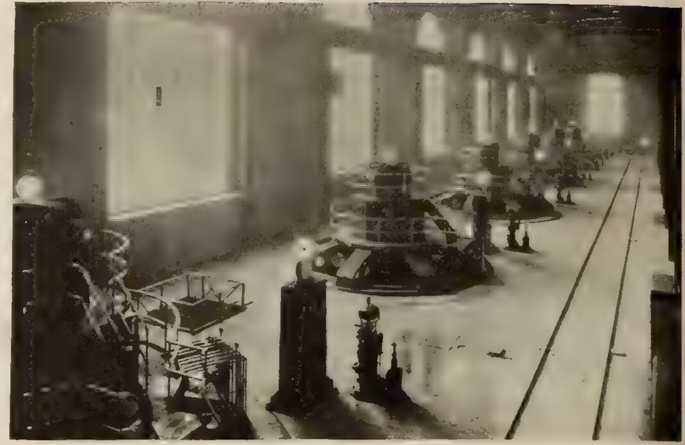
Generator rotor.

Below the main floor small chambers are partitioned off for each machine. This provides for cooling the dynamos. Air from the river level is drawn into the lower chambers, from whence it passes out through the slotted frames of the stators, impelled by centrifugal force. Blowers in the stator chambers send the air through shafts to the roof in warm weather. In winter the heated air is turned into the power house.

The main thrust bearings of the big machines are built to support 1,000,000 pounds. They bear the entire weight of the rotors, 615,000 pounds, the shafts, and the downward pressure of the water on the turbine runner blades. The weight of air necessary for cooling each machine will equal their weight, 1,400,000 pounds, every two and one-half hours. This is at the rate of 120,000 cubic feet a minute. The generator speed is 187.5 revolutions a minute. It is maintained by centrifugal governors, which are belted to the main shaft. The gate control at the turbines is hydraulic.

Current is delivered by the dynamos at 12,000 volts, three phase, 25 cycles, and is stepped up to 110,000 volts for transmission. The current goes to Toronto, Hamilton, London, and more than two hundred other towns in Western Ontario. The longest line is to Windsor, on the Detroit River, two hundred and forty miles from Niagara Falls.

To serve the big machines, cool and oil their bearings, start them and stop them in case of need requires an enormous amount of machinery, every piece of which is in duplicate. Oil pumps, water pumps, and air compressors are necessary. The oil is constantly filtered. All water used is filtered and treated to keep it from rusting the many miles of piping. One of the interesting details of the oil treatment is the use of cream separators to remove grit.



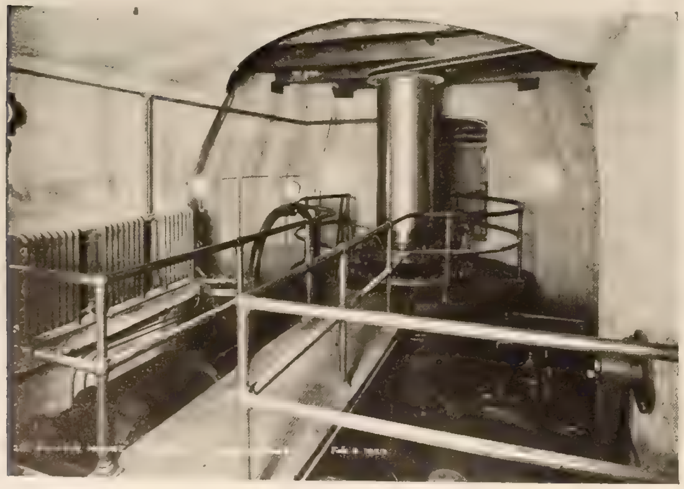
View of generator room.

Except for the steel columns supporting the cranes, which serve the generators, the entire building is done in reinforced concrete, with hollow tile used for some of the minor partitions. The power-house is as near fire-proof as can be made, a necessary precaution where electricity is concerned. There are two travelling cranes in the main generator-room. They can handle a load of 600,000 pounds.

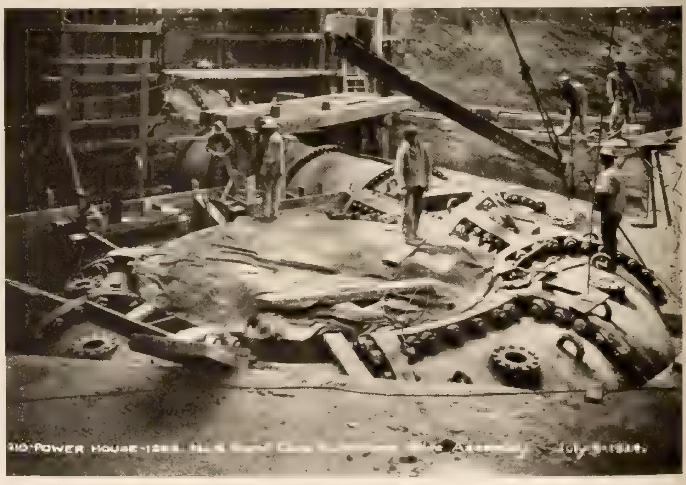
But the power-house, vast as it is, is only a small part of the whole development. From the canal were excavated 12,000,000 cubic yards of earth and 5,000,000 cubic yards of rock. This mammoth head race is 48 feet across, of nearly the same depth, and lined with concrete to prevent frictional losses and allow the passage of the maximum amount of water. The lining represents the pouring of 500,000 yards of concrete. The penstocks which carry the water from the forebay to the turbines, one for each unit, are of steel, 16 feet in diameter, and are covered on the outside with concrete.

Elaborate precautions are taken against ice. At the Chippawa intake concrete tubes run out into the river below the level at which ice runs. Such as may form in the canal and forebay is diverted by a boom and conducted over the cliff and beneath the power-house into the lower river through a 10-foot concrete ice-chute.

All in all, the Chippawa-Queenston development represents the best in engineering practice. And it is comforting to note that the architectural features have been designed with a view to the eternal fitness of things. It must be remembered that the Ontario plant is but a pioneer in the hydroelectric development of the America of the future. The age of electricity is only now dawning. What an opportunity for the architect in the vast projects to come!



Turbine dock.

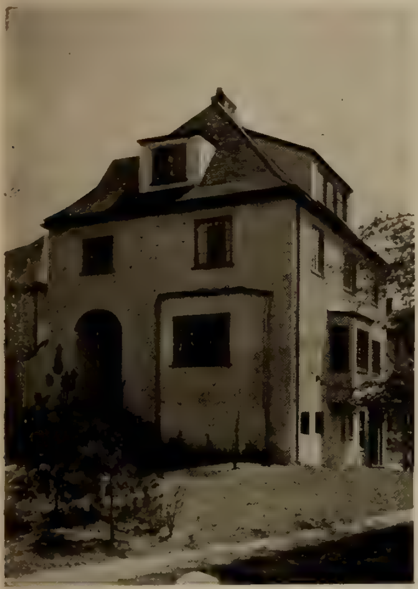


Scroll case and valve assembly.

House of Edward T. Sanderson, Architect, at Wellesley, Mass.

THE problem: To locate in a desirable neighborhood, near the station and civic centre, yet without spending all available funds on the lot. This clearly required building in height rather than in breadth.

The solution: An irregular-shaped lot, steeply sloping and restricted in size (the real-estate man's horror), tucked in back of other houses, near the highway but discreetly sheltered by it, and only three minutes from the square, or "Ville," as the college girls call it, the centre of collegiate activities. Wellesley had been decided on for family reasons. To the average passer-by, if he saw it at all, which was not likely, the lot would have appeared little better than a dump, requiring at best an enormous amount of filling in before building operations could even be contemplated.


House, Edward T. Sanderson, Wellesley, Mass.

The architect, however, seized upon these apparent disadvantages and turned them to account. The scheme grew out of careful consideration of grades and surroundings, with due attention to prevalent winds, etc. Three brick steps before the entrance and five more under the arch place the first story well up, without the appearance of undue height. This, together with the slope of the land, which is fortunately toward the south, enables the architect-owner to manage a small three-room-and-bath apartment underneath the dining-room and kitchen at the back, and on a level with the cellar. This is entirely separate, with its own entrance; and being never vacant in a college town goes a long way toward paying for the upkeep. It is also invisible from the approach on the north side, whence the house appears to be of the conventional two-and-a-half-story type.

As a colonial house was out of the question, inspiration came from abroad. To an informal treatment the steep roofs (thirteen and a half inches in the foot) give character, and add appreciably to the attic floor space. The front door, recessed between telephone and coat closets, admits of an entrance-porch without projecting beyond the building face. The archway, be it noted, is not a true semicircle, but a free-hand curve, laid out on the job, as the carpenter was putting up the scaffolds. Its sides are splayed, while an interesting iron lantern relieves the severity, and with its green glass adds a romantic touch by night.

For the sake of economy, exterior woodwork where possible was eliminated. Window frames are devoid of moldings; their plaster reveals come within a half-inch of the sash. Over them plaster hoods, borrowed from Bermuda, give a slight shadow and protect the tops of the casements from rain. No double-hung windows, except those in the "Midget" and over the kitchen sink, were used. Much of the difficulty inherent in casements was overcome by not pairing them. Each has its own frame, thanks to the mullions, which could be made thin as none is over four feet high. All are of the same width, twenty-one and one-half inches, with panes nine by eleven inches, which adds to the uniformity of the whole.

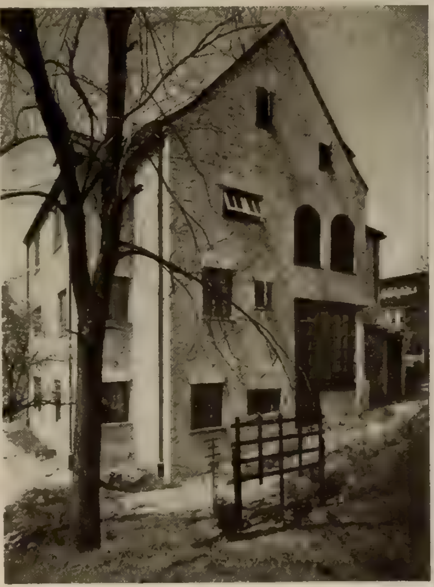
A cypress gutter, however, was decided on. This, as may be seen, although free standing is placed close to the walls, eliminating a cornice. To offset any harshness of effect, a slight easement in the roof is employed. The roofing material itself is a tapered variety of asphalt shingle, nearly black and small in size. They have weathered to a varying sheen, producing an effect not unlike that of slate; have, in fact, been taken for slate by the neighbors. Decks, flashing, and conductors are of copper.

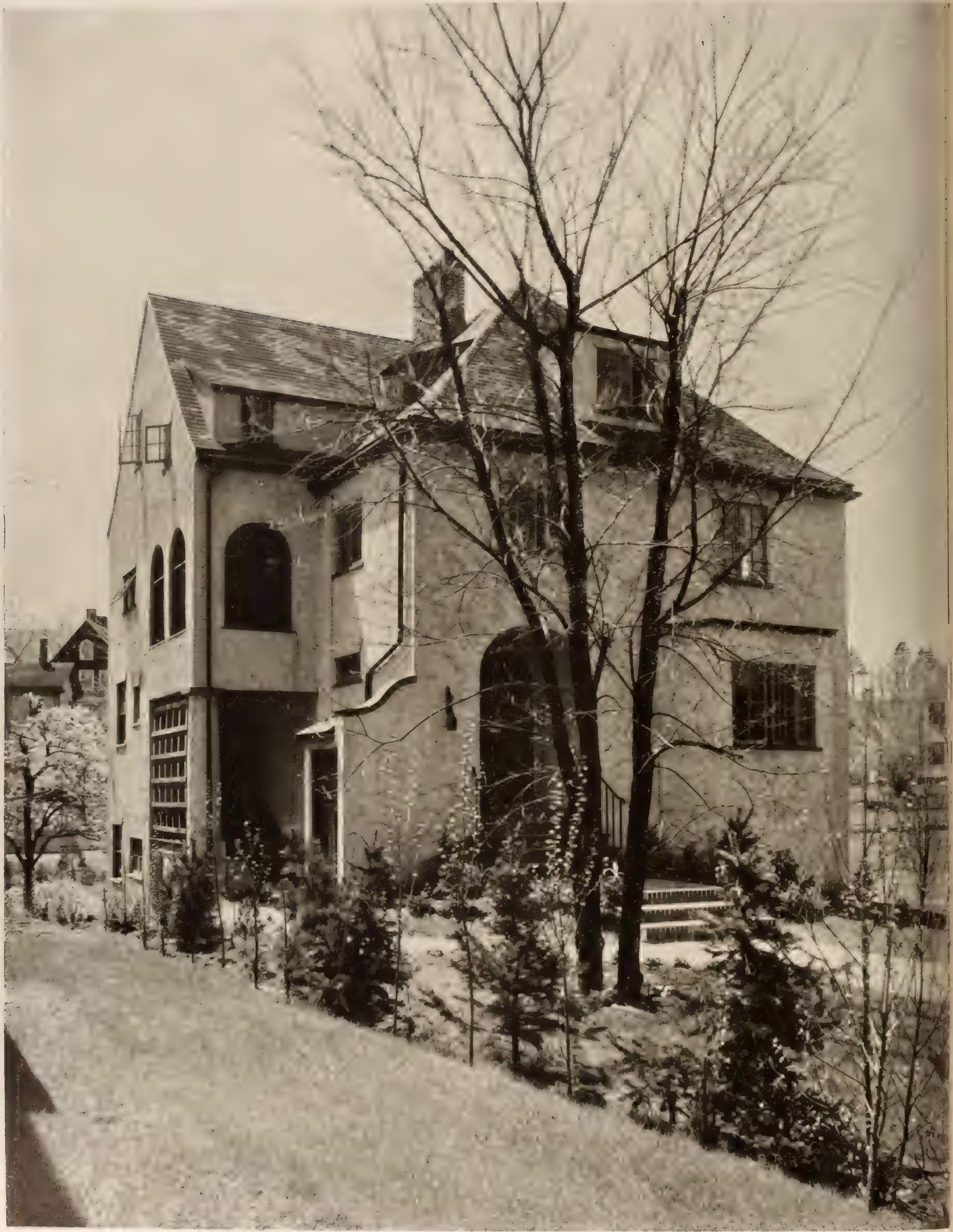
The second-story porch, back of the arcade, is an interesting feature, treated like a mezzanine, three steps below the floor level, and accessible from the stair-landing. This insures privacy, being neither of the first nor the second floor, and contributes to the picturesqueness of the exterior. It also enabled the architect to install a little den over it, under the eaves, in what would otherwise have been waste space.

The smallness of the casement prevents the screens, hinged on the inside, from becoming unwieldy; but the lighting is fully adequate, due to the fact that the sills are placed high and the ceilings are kept down to seven feet, eight inches. Shades are conveniently placed between sash and screen.

The plastering likewise deserves passing mention. Dry color was added to the mortar, and the walls throughout, except in kitchen and baths, show a rough scoured finish, rather coarser than is customary. By day they have a pinkish tinge, but vary in varying lights; by night they have that rare quality of being indefinable. The ceilings likewise are tinted. The whole effect has a mediæval touch in character with the architectural treatment, and forming a sharp contrast with colonial interiors common to this part of the country. This is borne out in the high wood wainscot and balusters of stair-hall and the unpainted oak trim of the living quarters.

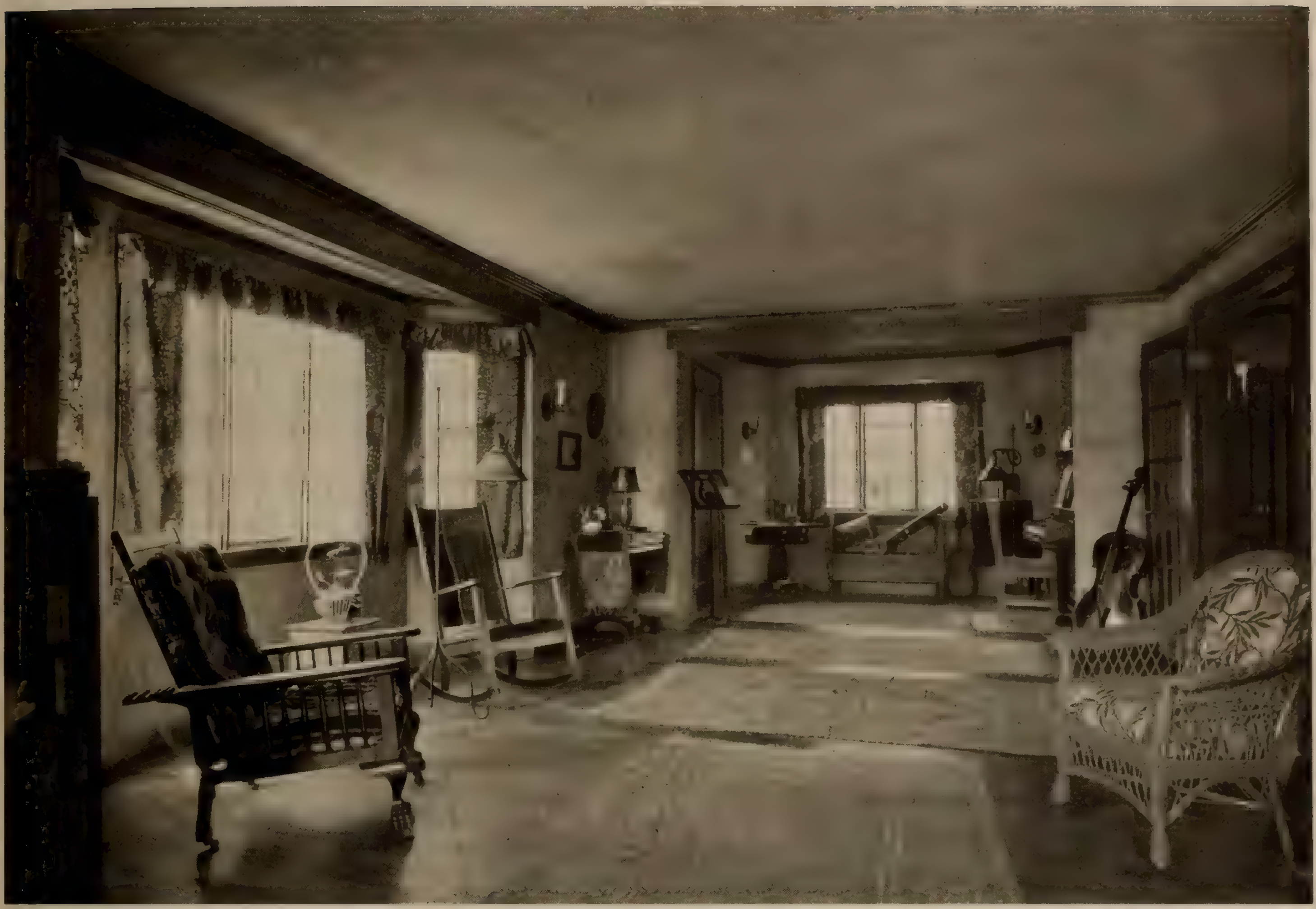
As no one realizes better than architects that real economy in bathrooms—expecially in regard to service—is secured by procuring the best of plumbing fixtures, no expense was spared in this respect. Inset tubs, tile floors, and walls of hard plaster with scoured sand finish and five-coat work are found throughout.


House, Edward T. Sanderson, Wellesley, Mass.

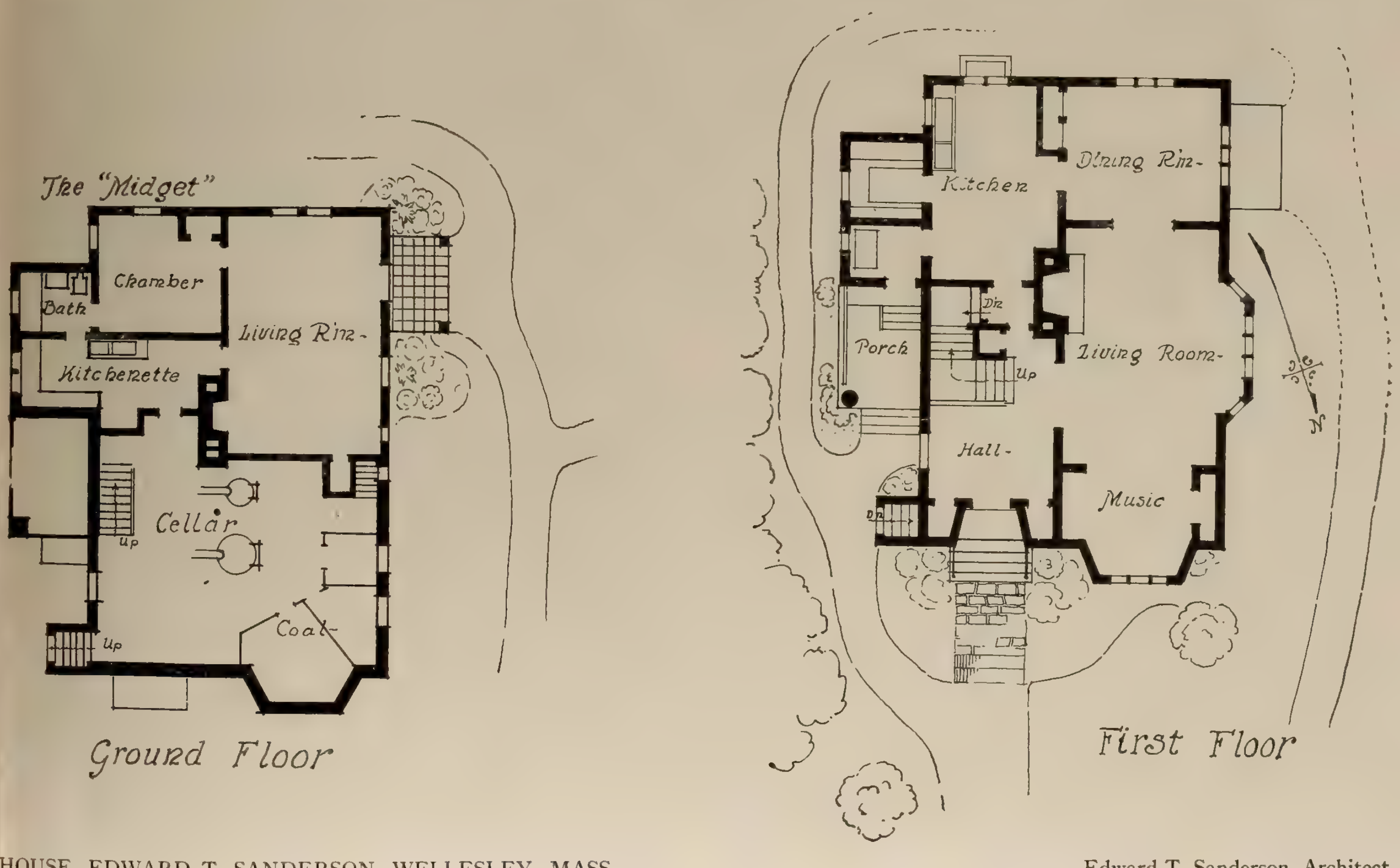


HOUSE, EDWARD T. SANDERSON, WELLESLEY, MASS.

Edward T. Sanderson, Archit



LIVING-ROOM, MAIN FLOOR.



HOUSE, EDWARD T. SANDERSON, WELLESLEY, MASS.

Edward T. Sanderson, Architect.

The School-Building for the Parish of SS. Peter and Paul, Fall River, Mass.

Cram and Ferguson, Architects

THIS is somewhat of a departure from the conventional schoolhouse design.

The style is modified Spanish. This brings it into harmony with the church standing across the street, which was designed by Cram, Goodhue, and Ferguson more than twenty years ago.

The material of the exterior is gray buff brick with cast concrete stone trimmings. One of the most prominent features of the exterior is the roof over the main entrance pavilion, which is executed in Spanish tile with a wide range of color varying from a sage brown to a dark purple.

The plan consists of a central corridor, flanked on each side by three classrooms. Coat-rooms of ample size adjoin each classroom. Staircases of iron and slate at each end of the building, enclosed in brick walls, provide ideal egress conditions.

The interior is finished in chestnut, stained a pleasing walnut brown. Natural slate blackboards are used throughout.

Fresh air is introduced into the classrooms by means of a separate ventilating unit for each classroom. The unit consists of a large radiator and a Multivane fan operated by an electric motor, the whole enclosed in an enamelled metal housing. The motors are operated by direct current supplied by a motor generator in the basement, and are practically noiseless at all speeds. The advantages claimed for the unit system are greater flexibility, the elimination of the central fan, fan-room, and large ducts in the basement, resulting in a saving in headroom and consequently in the cost of the building. In this particular building the absence of the unsightly ducts is a considerable advantage, as it results in a large, light, basement room, which is used for parish suppers and other parochial activities.

The foul air is removed from the classrooms by means of gravity ducts, discharging through ventilators in the roof in the usual manner.

Tests Point Way to Safe Elevators

SEVENTY-FIVE per cent of fatal accidents are preventable, the United States Bureau finds. About three-fourths of all fatal elevator accidents are found to occur at the hoistway door, either because of the door being opened when the elevator is not there or because of the elevator starting when the door is open. These accidents can be prevented by a reliable interlock, as when such a device is used the elevator must be stopped at the floor before the door can be opened, and the door must be closed before the car can be started again.

During the past year the Bureau of Standards has been conducting tests to determine the reliability of the various types now on the market. The devices have been given endurance tests under normal conditions, they have been tested in a corrosive atmosphere, in a dust-laden atmosphere, without lubrication, and under conditions of misalignment likely to occur in practice.

The tests were conducted at the request of the city of Baltimore, and will permit city governments to base their approval of such devices on actual performance tests instead of on visual inspection alone. The results have also been made available to the manufacturers of the devices tested, and in most cases they have improved their designs in accordance with the suggestions offered.

Show Paraffin Best for Waterproofing Stone

THE superiority of paraffin treatments for waterproofing stone has been demonstrated by a weathering test of colorless waterproofing compounds conducted at the Bureau of Standards, Department of Commerce, during the past three years. Samples of Indiana limestone and of sandstone have been used in the tests, one-half of each specimen being coated with the waterproofing compound, while the other half was left untreated.

Very little deterioration was noticed in the case of the paraffin treatments during the period of the test. Materials using aluminum stearate and mixtures of paraffin and china wood oil were also found to give good waterproofing values when properly applied. Materials consisting of solutions of glue, magnesium fluosilicate, cellulose nitrate, resins, etc., are not sufficiently durable to justify their use, in the opinion of the bureau.

Most of the materials tried discolored the stone to a considerable extent at first, depending on the porosity of the stone. Very dense types were not appreciably discolored, while very porous ones appeared greasy for several months after treatment. After a year or more of weathering the discoloration disappeared and the treated surface appeared lighter and cleaner than the untreated.

A new series of tests is being started with these materials on dense limestones and marbles. A new compound which has recently come into use in England consists of a silicon ester. This material is being included in the tests.

A Correction

IN Mr. Emerson's article on "Stone" in our June number he stated that the crushing strength of Quincy granite only averages around 10,000 pounds to the square inch and that the Vermont marbles average 13,500 and some blue stones 19,000.

The result of recent tests made on three cubes of Quincy granite by Mr. Irving H. Cowdry, of the Institute of Technology, Cambridge, Mass., shows that the crushing strength of Specimen No. 1 was 22,900 pounds; No. 2 was 30,150 pounds; and No. 3 was 28,900 pounds—making the average 27,317 pounds.

We have received an interesting illustrated pamphlet written by Mr. William M. Adrian, giving a brief history of Quincy and some instructive facts about Quincy granite and its uses.

Dominion of Canada War Memorial

GAETANO CECERE, sculptor, and Lucian E. Smith, architect, in collaboration, were successful in winning a place in the final competition for the Dominion of Canada War Memorial to be erected in Connaught Square, Ottawa. From the 127 contestants in the first stage seven were chosen to enter the final competition which is due to render the middle of November. Of the seven selected three were from England, two from Canada and one from Scotland.

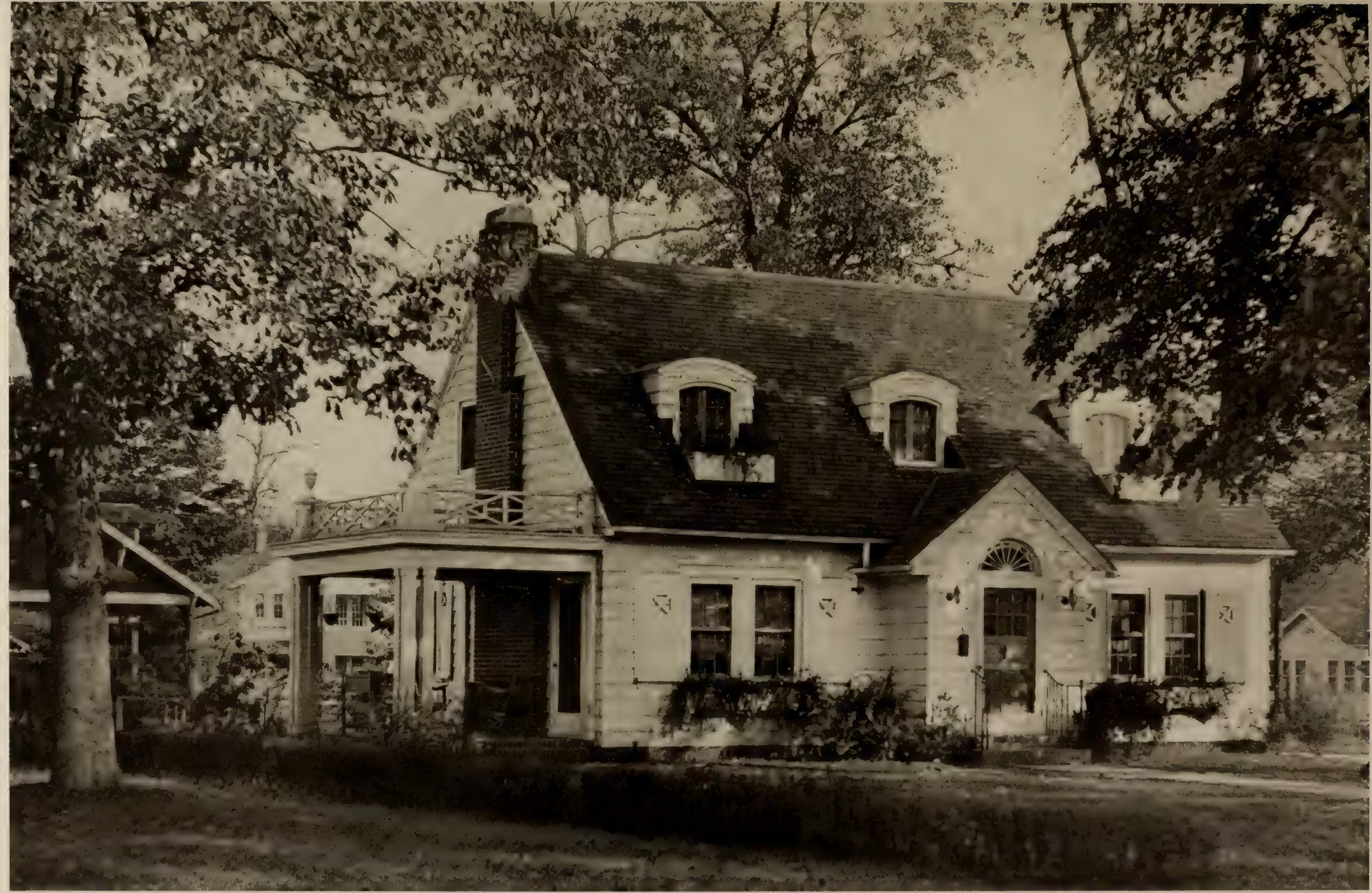
Both Mr. Cecere and Mr. Smith are of the American Academy in Rome.

Book Reviews

ENGLISH ARCHITECTURE AT A GLANCE. A Simple Review in Pictures of the Chief Periods of English Architecture. With historical notes by FREDERICK CHATTERTON. G. P. Putnam's Sons, New York.

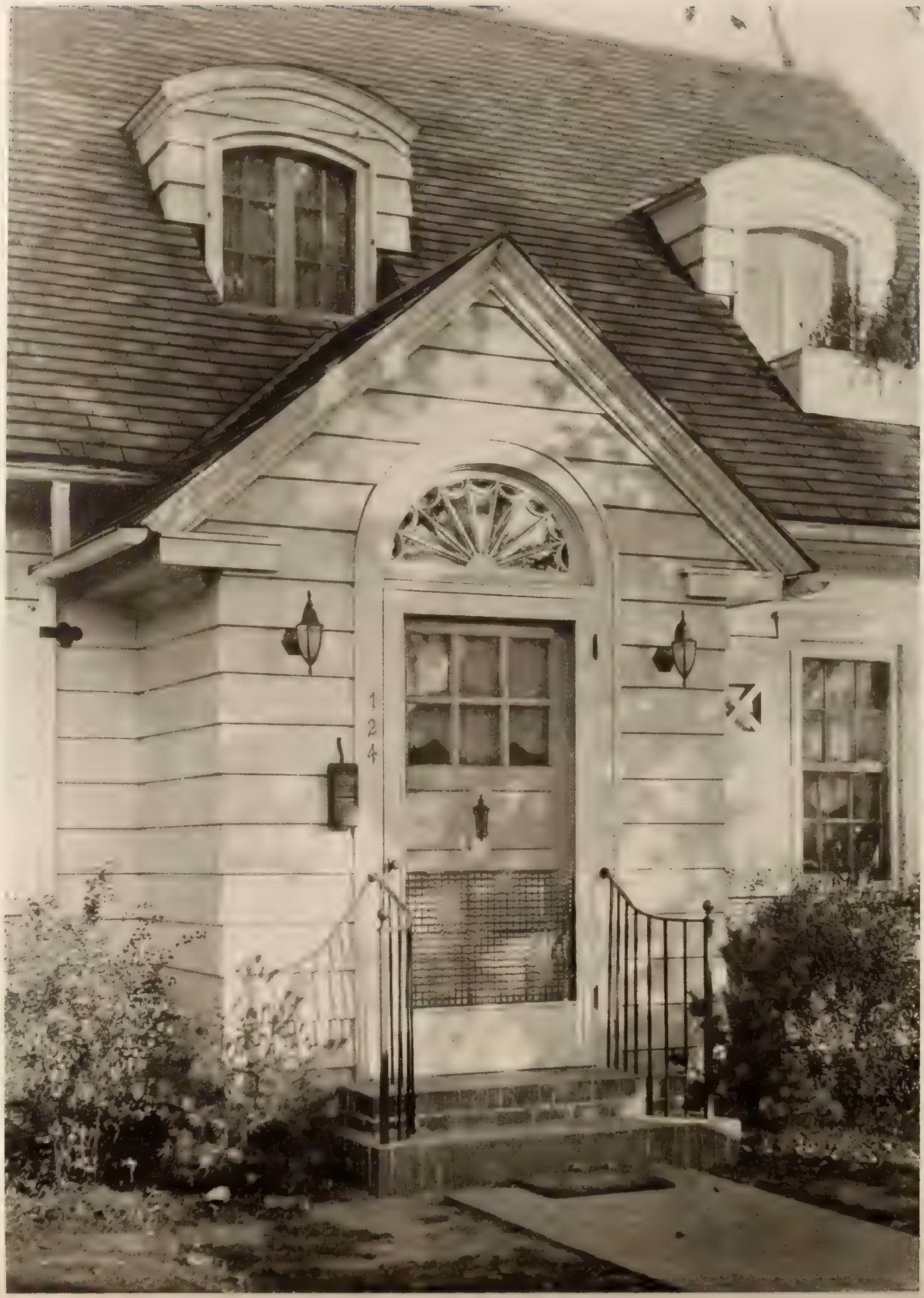
These are books for those who run and read, for the amateur rather than the architect, for those who haven't time "to read much."

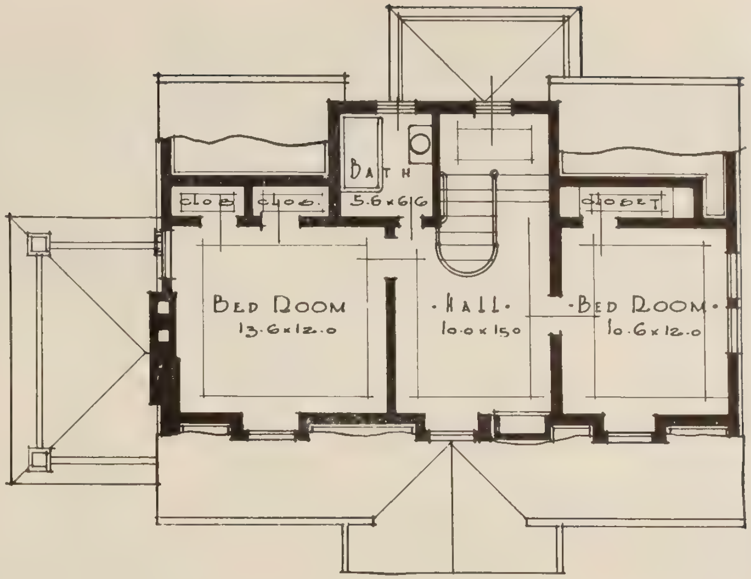
The text is subordinated to the numerous illustrations and those in the book on furniture are generally excellent. The drawings of architectural details would have been of more value if they had been drawn with greater care.

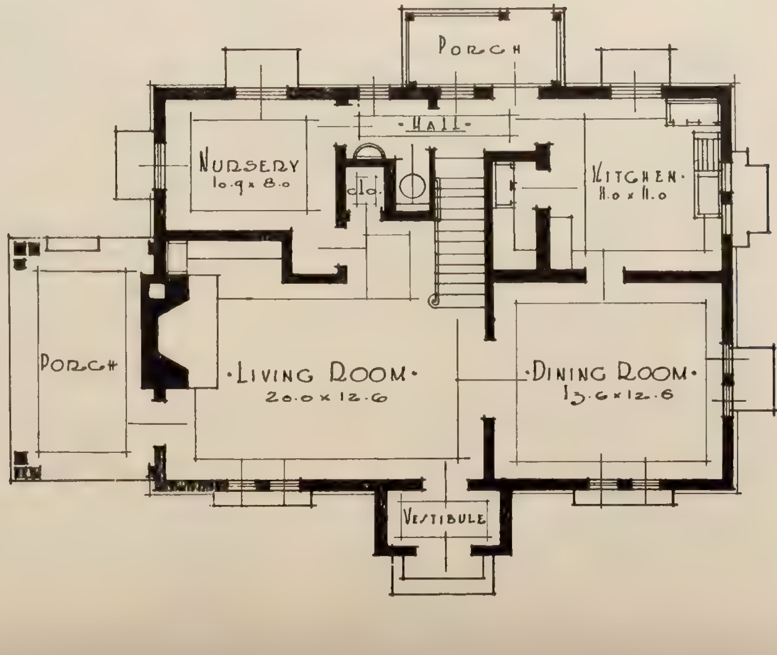


HOUSE, FRANK CRANFORD, TERRE HAUTE, IND.

Johnson, Miller, Miller & Yeager, Architects.







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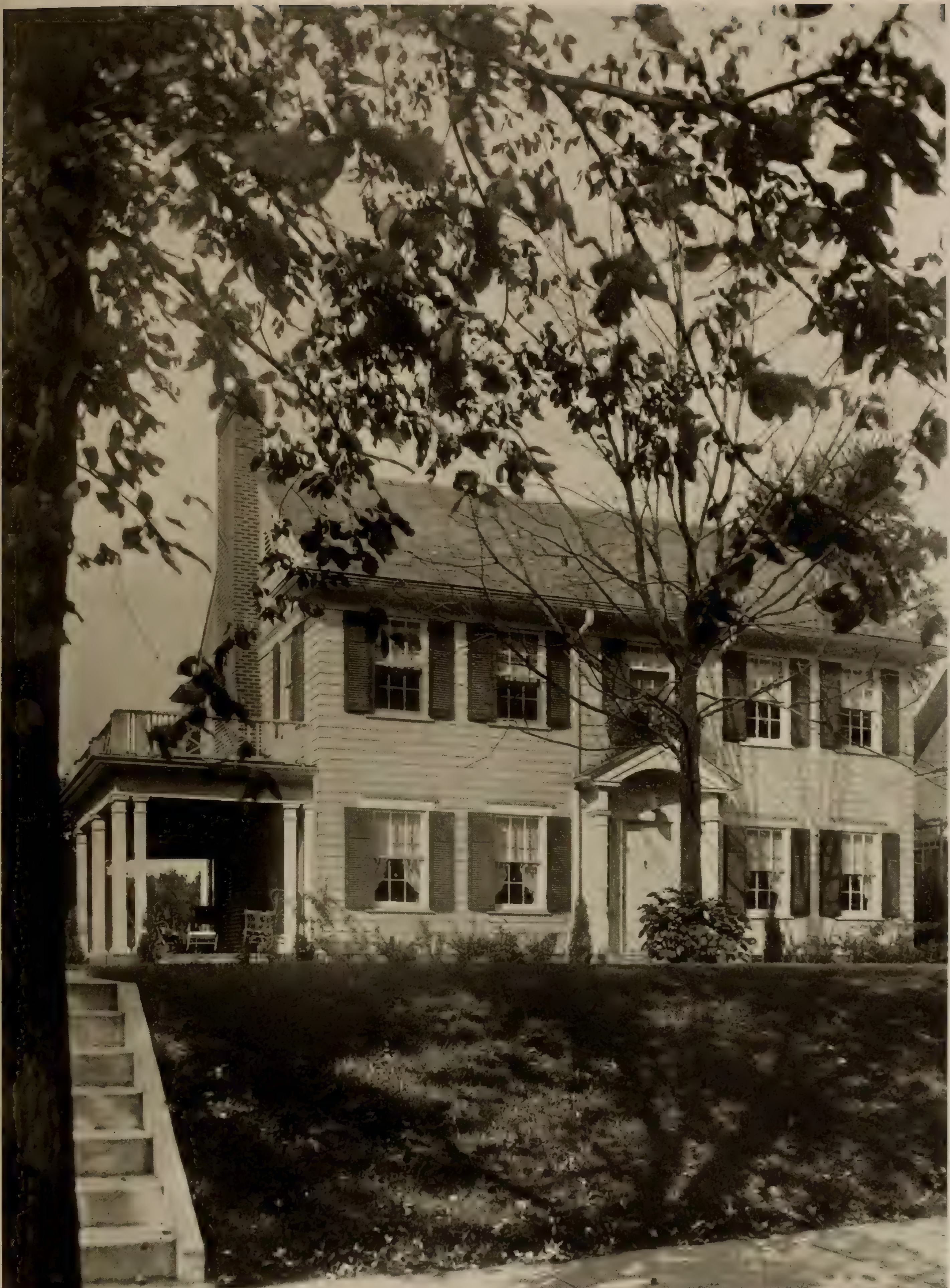
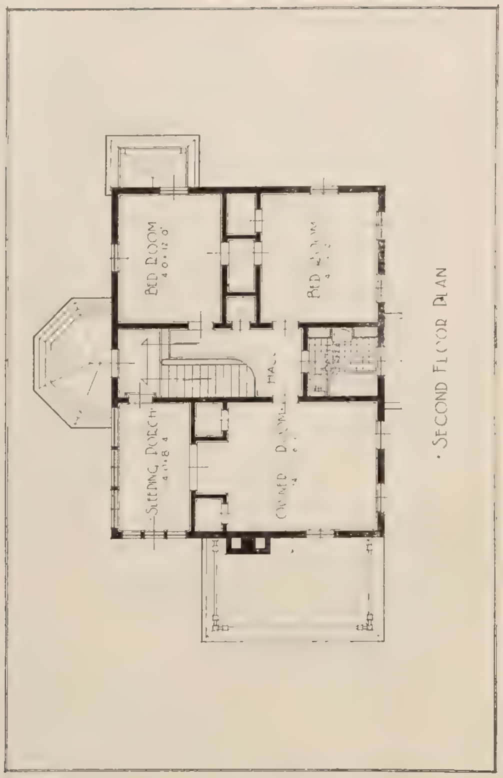
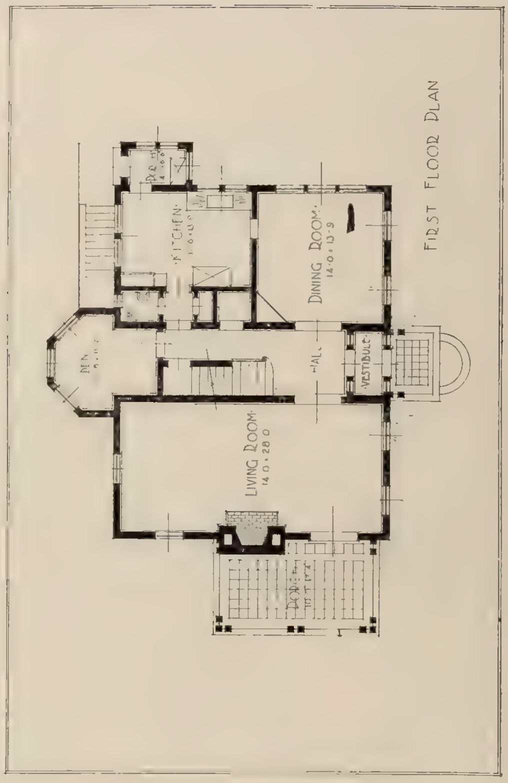
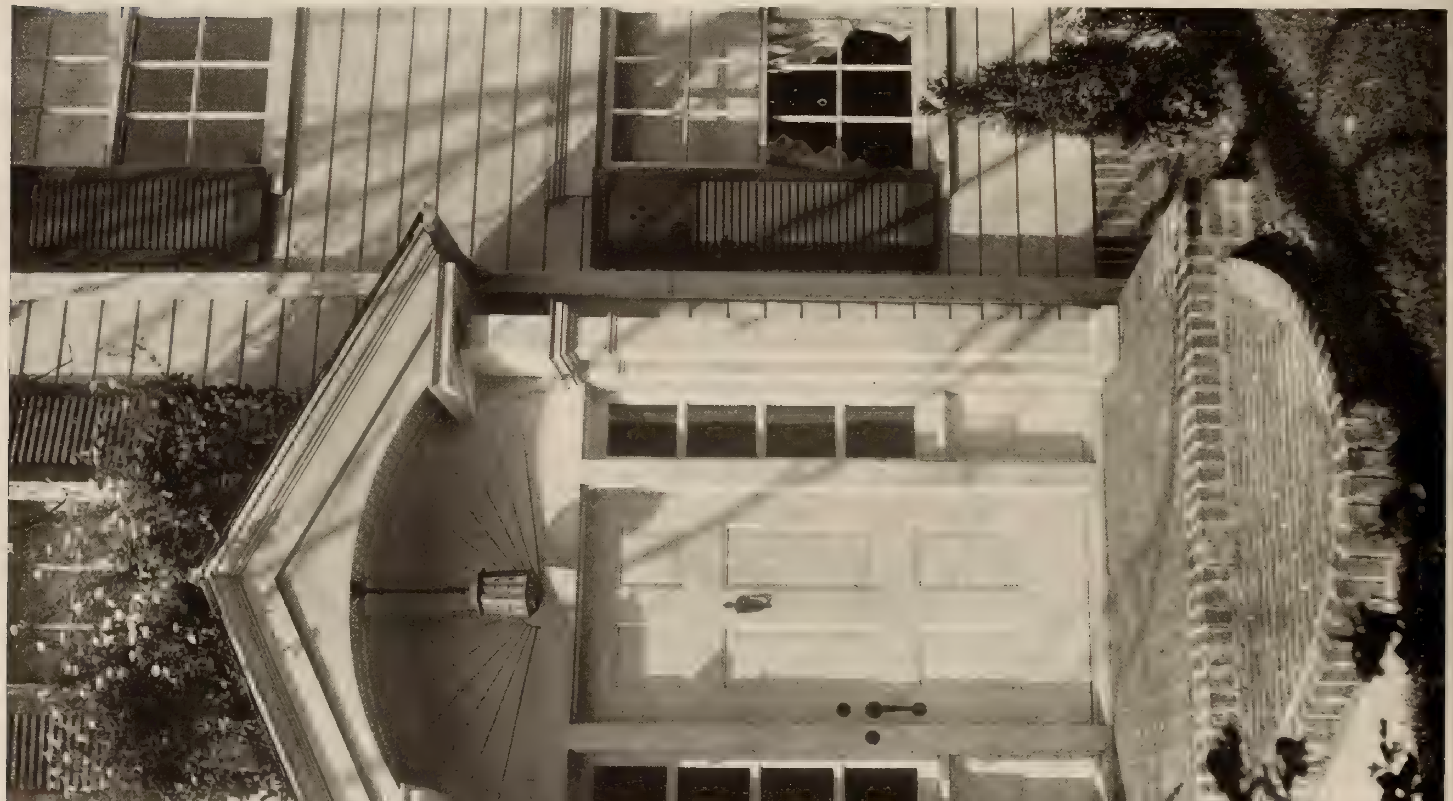


HOUSE, L. A. CARROLL, KNIGHTSTOWN, IND. McGuire & Shook, Architects.







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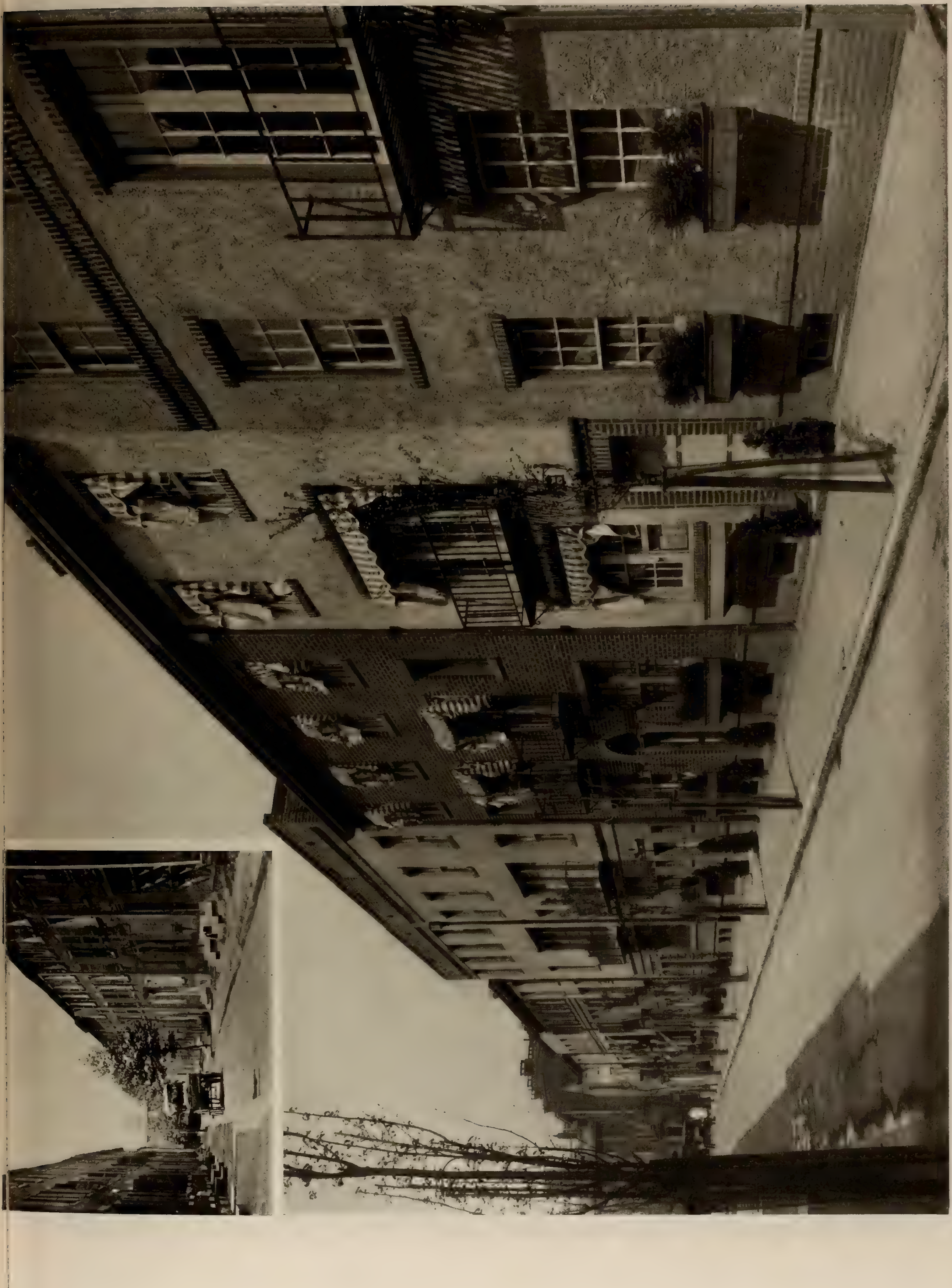
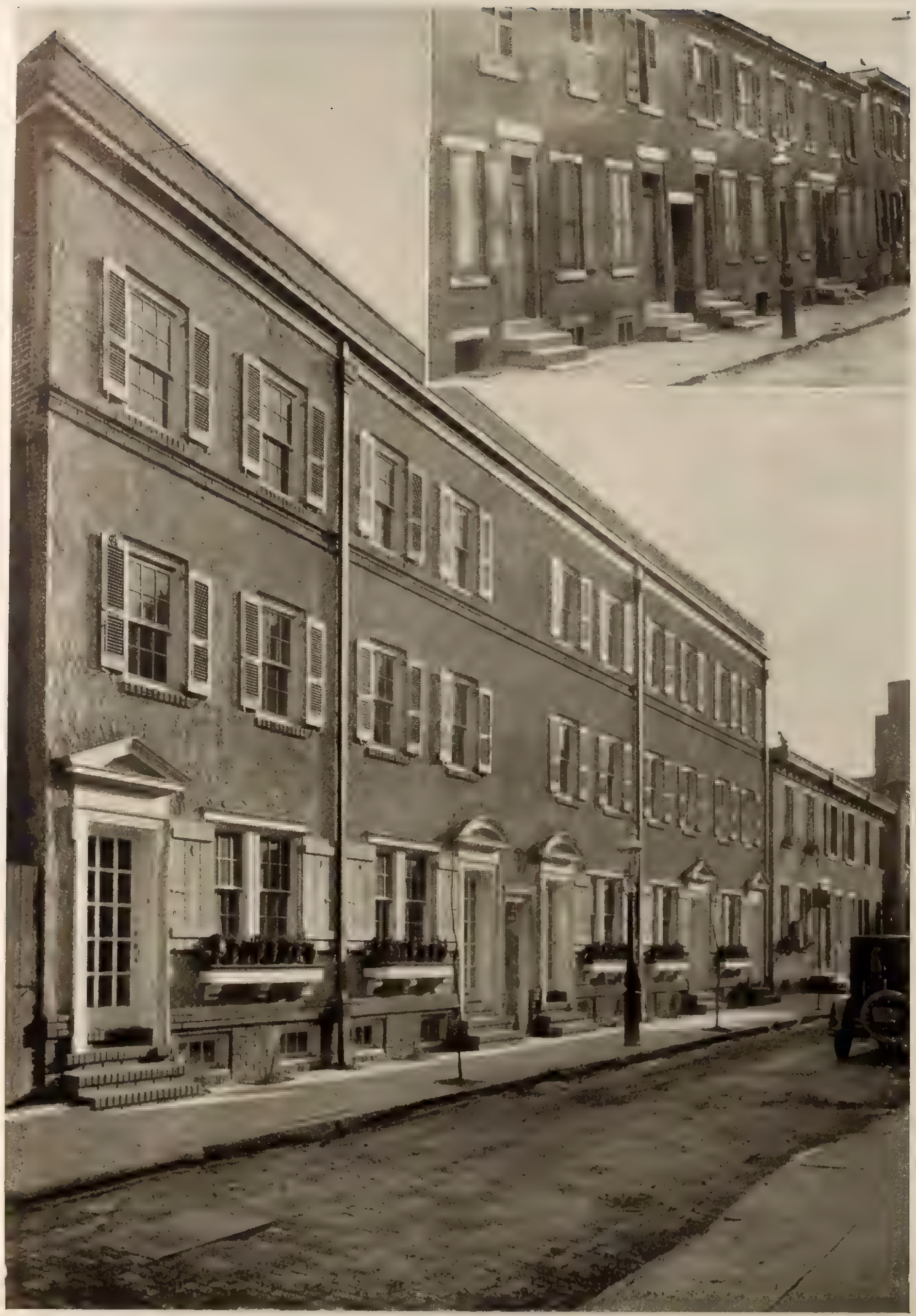
McGuire & Shook, Architects.

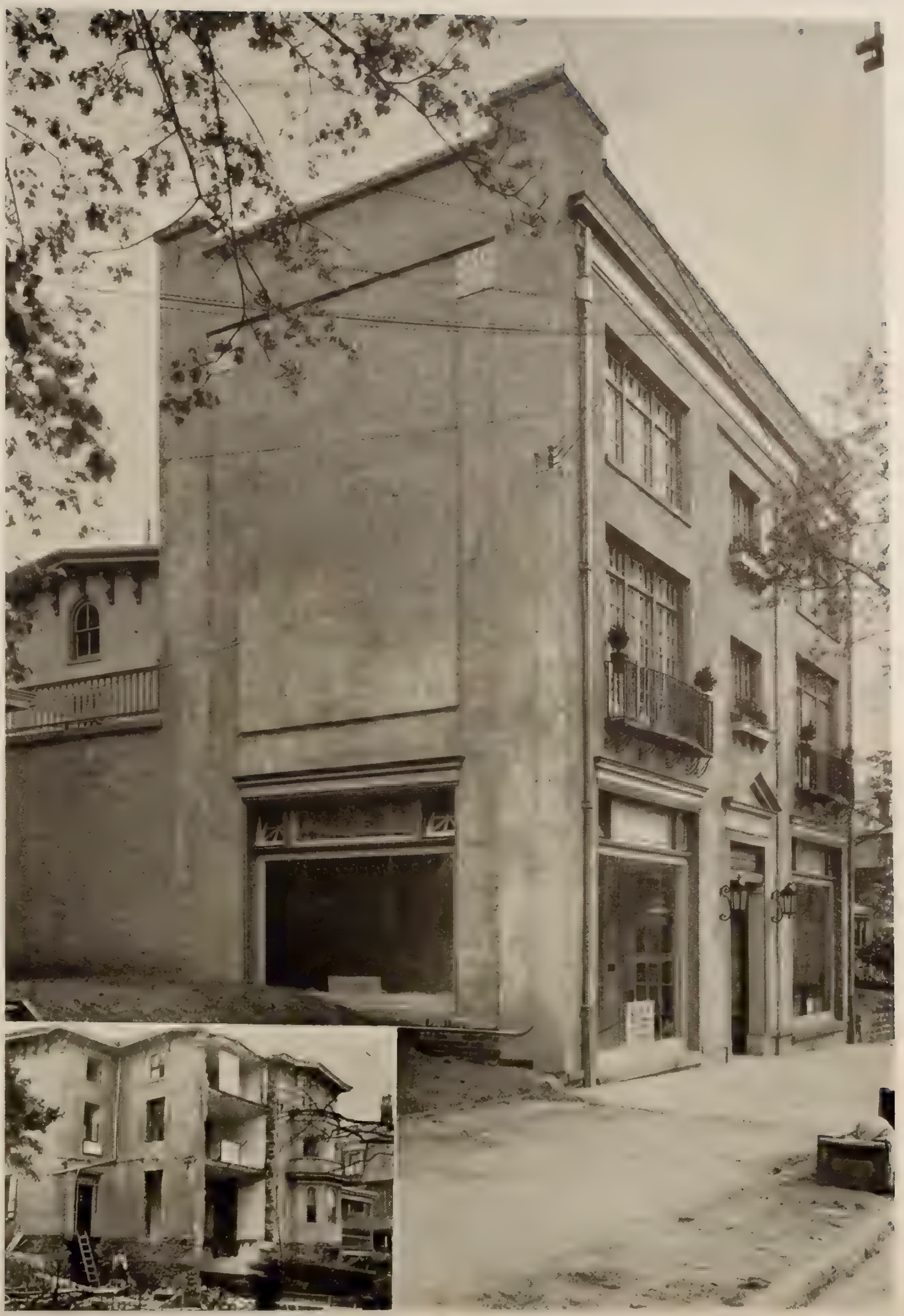


ALTERATIONS IN PANAMA STREET, PHILADELPHIA.

Wm. B. Koelle, Architect.

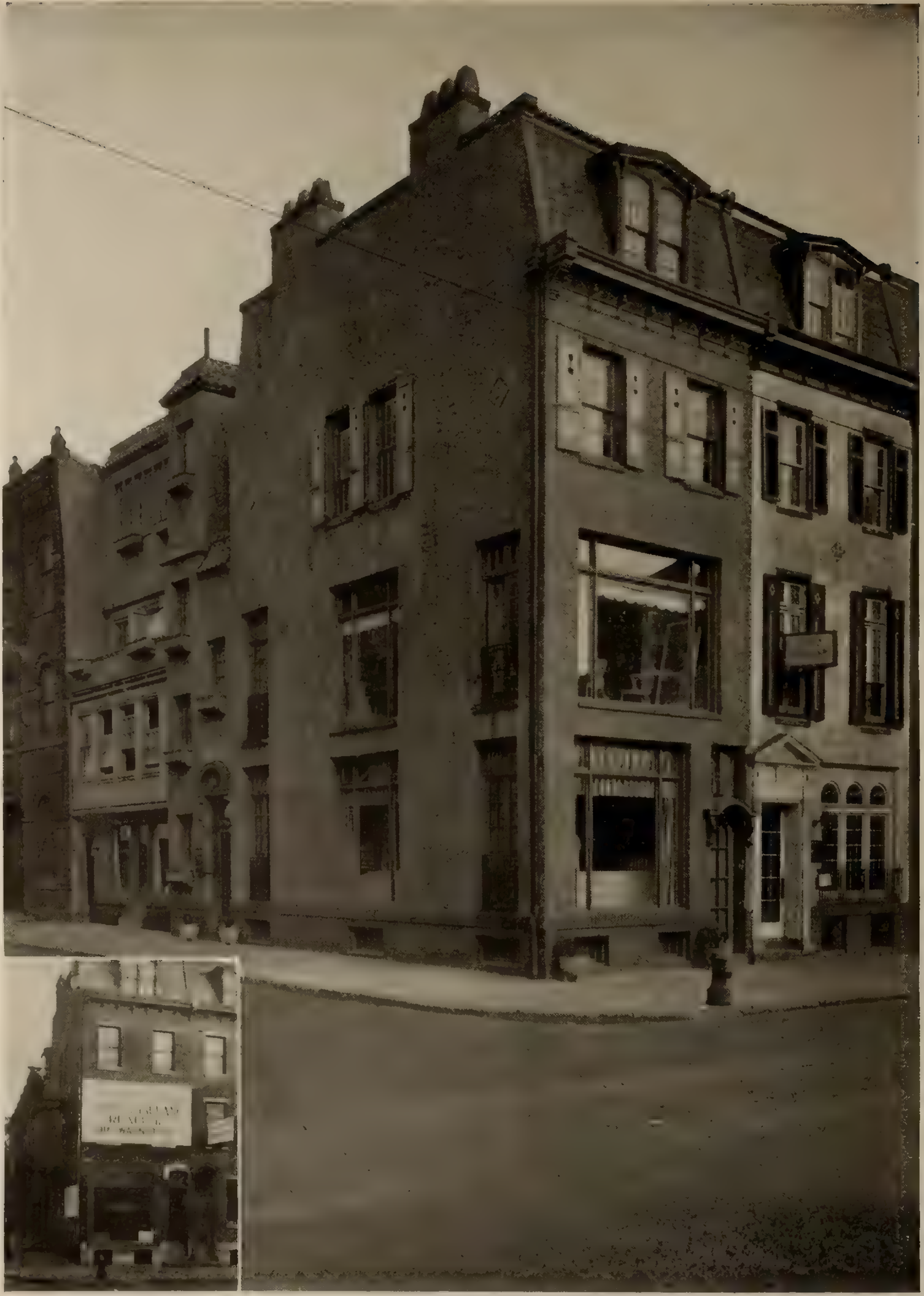


ALTERATIONS IN VAN PELT STREET, PHILADELPHIA

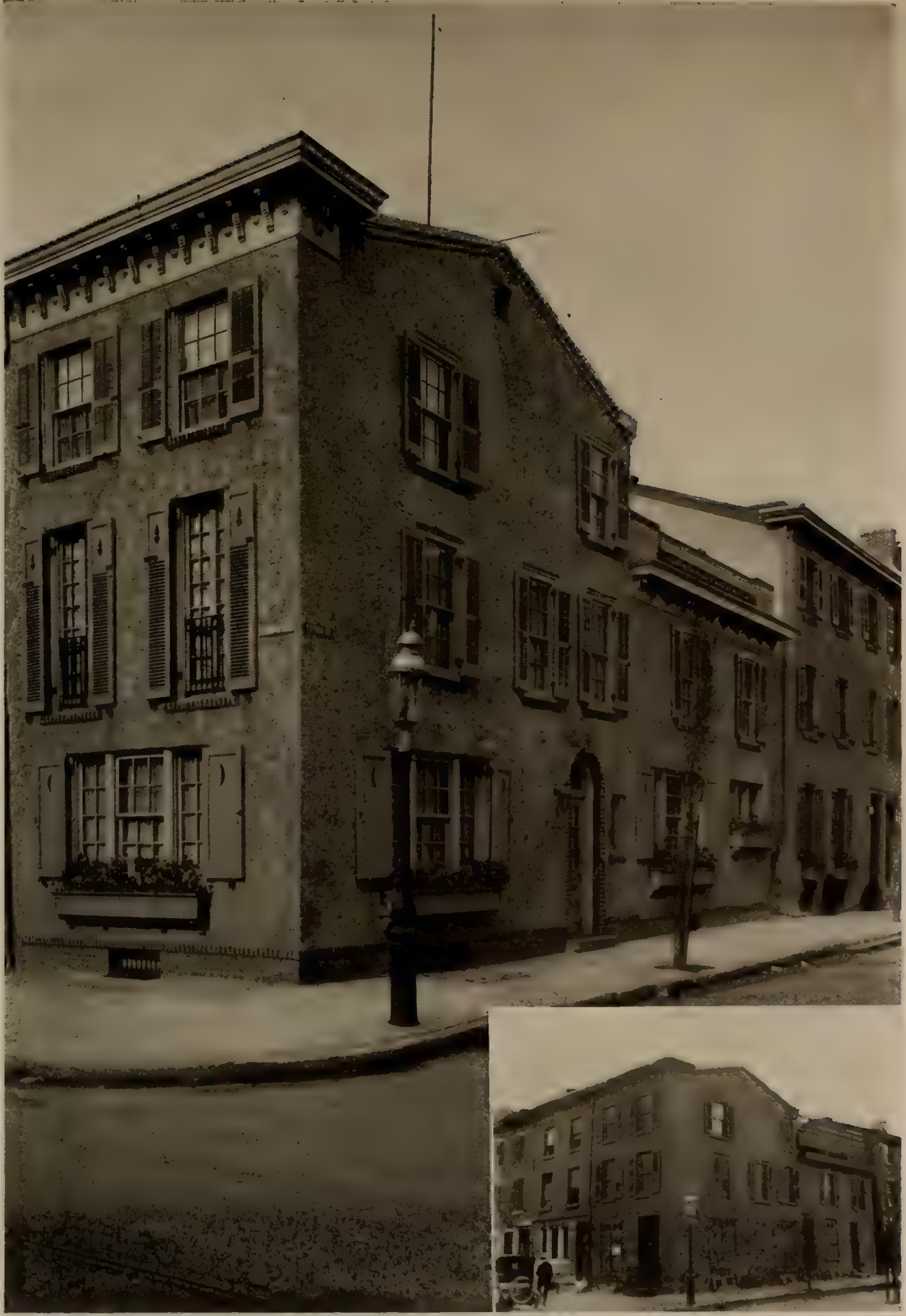


ALTERATIONS, 210 W. CHELTON AVENUE, PHILADELPHIA

Wm. B. Koelle, Architect.

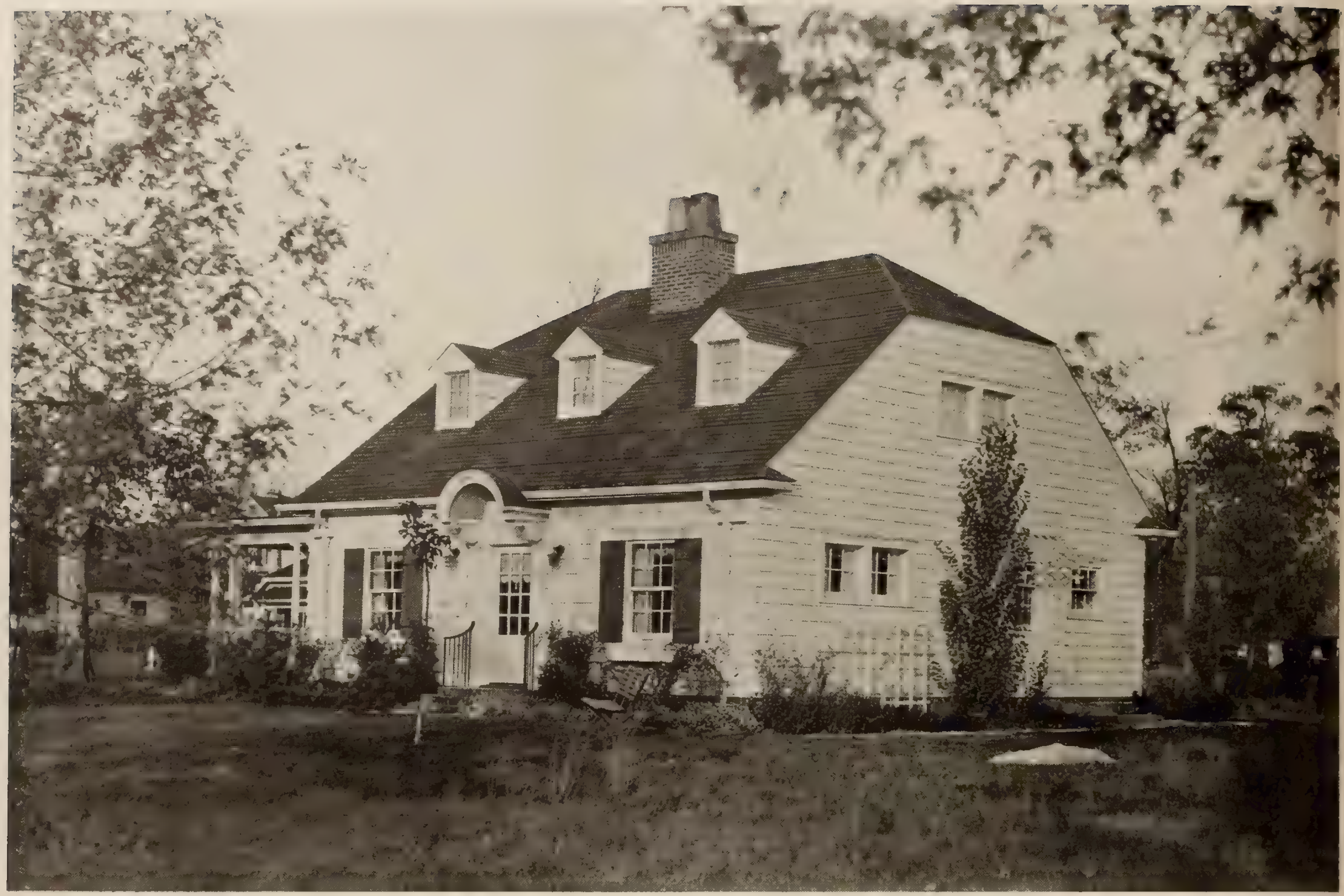


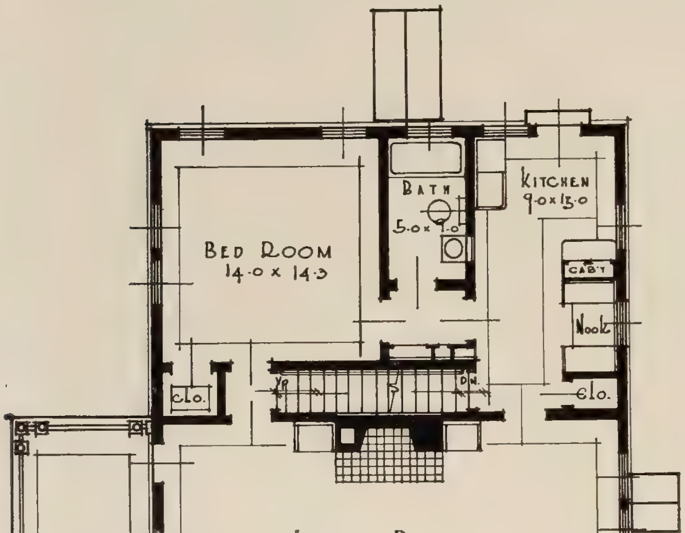
ALTERATIONS, 219 SOUTH 17TH STREET, PHILADELPHIA.

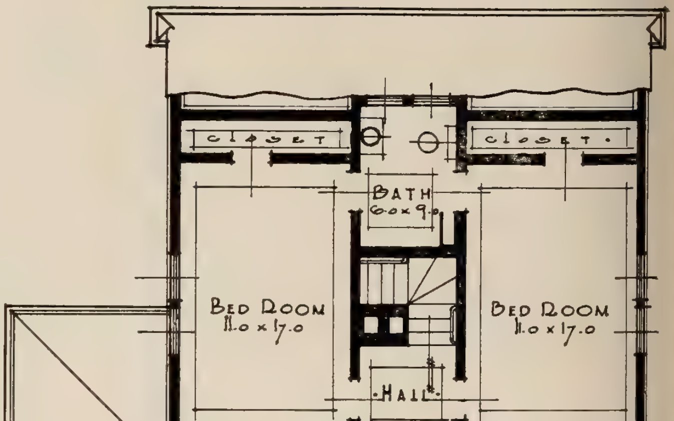


ALTERATIONS, 19TH AND PANAMA STREETS, PHILADELPHIA.

Wm. B. Koelle, Architect.







HOUSE, FREDERICK PAYNE, TERRE HAUTE, IND.

Johnson, Miller, Miller & Yeager, Architects.

The Romance of Building

By Richard P. Wallis

THIRD ARTICLE

N selecting the material for the façade of a monumental structure such as the library, the architect was impelled y motives of professional responsibility to choose a substance at would readily lend itself to the expression of dignity d design that he sought to realize, yet at the same time be dowed with those characteristics and properties of durabil- y that would perpetuate his handiwork in its original state preservation.

The character of this exterior masonry must definitely press the respectability of the use to which the building dedicated. As a part of the impressive Mall scheme due nsideration was of necessity given to the design and aracter of the neighboring structures in order that the ity of this proud group be preserved. Concomitantly with is factor of appearance the architect must not lose sight the necessity of selecting a material that will successfully ntest the insatiable efforts of nature to reduce all substance dust. These agencies of destruction are frost, moisture, d the sulphur-laden atmosphere of a great manufactur- g city.

The selection by the architect of a mezzotint Georgia arble from the celebrated quarries located at Tate, Pickins ounty, Ga., for this particular structure was particularly rtunate.

The dove-gray tint of this beautiful crystalline stone, cked with faint streaks of grayish graphite, its many facets glistening in the sunlight like a huge lump of sugar, gives to the structure that character of richness without ostentation that is so commendably suitable.

The dense, compact crystalline structure of this material, over 98 per cent of which is pure calcium carbonate, is admirably adapted to the simple ornamentation that is applied to the building in the form of carving, tooling, and so forth.

This same characteristic affords an exterior free from flaws and surface imperfection that defies the efforts of wind and weather to discolor and destroy. Having an absorption of substantially 90 per cent less than its nearest rival, it is evident that there is but scant likelihood of stains resulting from an infiltration of water containing foreign materials in solution. A block of this marble weighing 100 pounds will absorb but .028 pound of water—certainly not an amount sufficient to entitle it to good standing in the sponge family.

The closely interwoven structure of this marble enables it to develop a crushing strength of 13,100 pounds to the square inch, or 935 tons to the square foot.

The design of the architect called for an amount of 105,000 cubic feet in this structure, including the balustrades and areas at the sidewalk level. Loaded in the manner in which this material was received from the quarry, each piece carefully crated and numbered to agree with the setting plan, a single freight-train over two miles in length would be required to convey the marble from the quarry to

View of the genuine Hauteville C. H. Quarry, showing methods of extraction by wire saw and pneumatic drill, and blocks in preparation for shipment.

Quarries at Nelson, Ga., source of exterior marble for Cleveland Public Library.

the building site. When it is considered that each and every block entering into the construction of the library was quarried, dimensioned, and finished by mechanics in a plant six hundred miles distant, whose sole source of information as to the requirements of this particular operation consisted of drawings made practically before building operations were commenced, and that this masonry co-ordinated exactly with the products of window manufacturers, bronze and iron foundries, and various other trades, all located in widely scattered sections of the country, it is indeed to be wondered at that such perfect harmony of effort, as is actually in effect, was attainable.

This delivery of completely fabricated parts to the building site for inclusion therein is but typical of practically all of the crafts involved in the intricate business of modern building construction. The excellent results here obtained afford an admirable commentary on the precision of manufacture attained by these plants.

The story of the origin and the manufacturing methods employed in the production of this marble is intimately woven, not only into the history of man from its earliest beginnings but into that much vaster measure of time, the geologic epochs. Much of the history of the genesis of the earth is written in unmistakable terms in these rock formations, needing only the shrewd interpretation of the geologist to depict the almost infinite durations of time and the cataclysmic forces that have left the earth as we find it to-day.

The rich deposits from which this marble was taken are located in northern Georgia and cover a known area of approximately four miles in length by three-eighths of a mile in width. A depth of 185 feet has been reached with no apparent indication of the deposits running out, and an ultimate depth of over half a mile is well within the realms of possibility.

Assuming an average depth of only 200 feet, a reasonably safe assumption, a truly stupendous mass of marble, amounting to some 8,363,520,000 cubic feet in volume, is available for the many purposes to which this material is put. At the current market price this deposit represents in value the sum of $12,545,280,000, which is a sum greater than the entire interest bearing debt of the United States in the year 1918.

Geology tells us that thousands of years were consumed in the creation of this deposit. At one time, some years ago to be sure, the stratification immediately underlying this deposit, at whatever depth it may be, represented the sea bottom. Upon this ocean bed there rained in patient succession the débris from countless millions of organisms that lived and died in that prehistoric sea. In time the calcareous deposits of shells, skeletons, etc., became consolidated under its own pressure and became a limestone. In turn this limestone became subjected to certain crustal stresses set up by the gradual contraction of the earth's surface. These titanic forces, generating much heat in their activity, wrought a metamorphosis of this limestone into a fully crystalline material, which we to-day know as marble.

This same age-long process has been reproduced in miniature in the laboratory and synthetic marble created by subjecting to great heat limstone and chalk contained in a closed gun-barrel.

The formation of organic calcareous sediments is going on to-day in the ocean on a large scale about coral reefs and shell-beds and wherever the minute calcareous shells of various marine organisms are deposited upon the ocean floor and wherever lime-secreting algæ abound.

It is from a consideration of facts as patent as these that we are forced to abandon any preconceived thoughts we may harbor as to the permanency of the earth or any part thereof upon which we dwell as we ourselves are acquainted with it.

Where the fine Italian marble is quarried in the Apennines Mountains, near Carrara, Italy.

The mighty forces of nature are forever bent upon an endless redistribution of the earth's ingredients. We, as observers, are limited in our observation by the infinitesimal span of years allotted to us, and we fail to realize that there is no finale to nature. Seas existed where arid deserts now bake in the pitiless sunshine, yet who can safely prophesy but that in some far distant epoch old King Neptune may there again reign supreme?

The quarrying of these marbles by the age-long processes of chemistry and physics is to-day fundamentally the same as the practice of the ancient Greeks. The principal innovations made in late years have been in the introduction of modern motive power in the carrying on of the operation of removing these blocks from the ledge and their subsequent treatment. Pliny describes much the same system of sawing marble as that employed to-day. Mills similar to those in present use, driven by water-power, were established in Germany during the fourth century, and Leonardo da Vinci, that versatile genius of the Middle Ages, was fully conversant with the various principles involved.

To-day electricity, compressed air, and steam have supplanted manual labor and even water-power in the various processes incident to the manufacture of marble for commercial purposes.

The unprecedented demand for marble and the refinement introduced in the last few years in quarrying this most beautiful of building stones have practically eliminated waste, and have necessitated the exploitation of known deposits to much greater depths than were ever thought economically possible by our forefathers.

Blocks of Georgia marble waiting for the finishing touches.

The presence of valuable deposits of marble is made known by occasional outcropping of the topmost stratum. Often vast areas of seemingly commonplace country (no country is in reality commonplace) are underlaid by unsuspected wealth in the form of marble waiting merely the prying eye of the geologist.

The particular quarries from which were taken the Georgia marbles used in the construction of the library were first worked about the year 1840 by the original Samuel Tate, the grandfather of the present owner, Colonel Samuel Tate.

Gazing down into one of these serrated cavities one is impressed with the almost geometrical patterns that meet the eye, wrought by successive quarrying operations.

The perpendicular cliffs of glistening sugar-like material, weather stained and soot bedecked, contrast most strikingly with the verdant foliage and the typical red Georgia soil of the surrounding landscape.

As we descend the rickety wooden ladder leading to the field of operations we are more and more impressed by the patient, untiring efforts necessary to rive these blocks from the perpendicular face of the quarry.

Unlike the quarrying of raw limestone for use in Portland cement, blasting operations are not permissible, owing to the shattering effects of the explosives upon the blocks of marble. The tough blocks must be taken individually and with great care from their natural bed.

A steam-channelling machine, travelling backward and forward over a steel rail track, cuts a narrow channel through the solid marble bed outlining the dimensions of the particular block to be removed. Next a series of horizontal holes is drilled at the proper level, and wedges are driven home, separating the the rough block from its natural bed. Additional blocks are cut on the same level, working toward the walls of the quarry. As each level is exhausted, fresh cuts are made in the new floor, and the process continued. Great derricks hoist these rough-hewn blocks to waiting flat-cars for transportation to the the storage yards and finishing mill.

In the finishing mill these rough blocks are sawed into slabs of dimensions dictated by the purpose for which they are intended. The gang-saws, set in frames, a dozen or more blades to a frame, swing slowly backward and forward across the block. Abrasive material is fed into the slowly deepening grooves, together with a jet of water to give the proper bite to the saw-blades.

The slabs, now formed to the proper rough dimensions, are ready for the finishing touches. It is the turn of the stone cutters and carvers to apply their skill to the carrying out of the architect's instructions. Certain blocks receive a rusticated finish, others are tooled smooth, some wrought into fluted drums for the imposing colonnade; balusters are turned, and hand-rails carved.

Once loaded upon the flat-car for delivery to the railroad, the preliminary work is done, and it remains only for the contractor to assemble these blocks to form the ornate shell of the building.

All July Building Records Were Broken

CONSTRUCTION contracts reached the highest July total on record, according to F. W. Dodge Corporation. Contracts in the thirty-six Eastern States (which include about seven-eighths of the total construction volume of the country) amounted to $529,000,100. In only two previous months has this total ever been exceeded, April and June of this year. The decrease from June was only 2 per cent, while the increase over July of last year was over 53 per cent. There is usually a fairly considerable seasonal decline in July.

Last month's record included: $224,712,500, or 42 per cent of all construction, for residential buildings; $72,743,400, or 14 per cent, for public works and utilities; $67,165,900, or 13 per cent, for commercial buildings; $58,148,000, or 11 per cent, for industrial plants (including a $30,000,000 power development in Ohio); and $57,572,000, or 11 per cent, for educational buildings (including large building projects for Harvard, Yale, and Pittsburgh Universities).

Last month's figures brought the year's total of construction started to date up to $3,189,173,800, an increase of nearly 20 per cent over the first seven months of 1924. At the end of June, this year was only 15 per cent ahead of last year.

Contemplated new work reported in July amounted to $702,431,300. This was an increase of 5 per cent over the amount reported in June and 63 per cent over the amount reported in July of last year.

West Point to Have a New Hotel

DRILLING and blasting are under way at West Point for the foundations of the Thayer Hotel, which will replace the historic old West Point Hotel. Rock from the foundations will be utilized in the structure, which has been designed by Caughey & Evans, architects, 29 West 34th Street, New York City. The architecture will be early Tudor, with battlements and turrets in keeping with the post architecture.

For the Structural Steel Industry

ADOPTION of the Code of Standard Practice, reports of signal progress on the Standard Specification promulgated by the organization, adoption of improved cost-finding policies, and plans for the publication of an authoritative handbook for the structural steel industry were among the significant features of the convention of the American Institute of Steel Construction, at French Lick, Ind., last November.

The Code of Standard Practice, the second signal step taken by the Institute toward the goal of standardized, uniform practice throughout the industry, has been pronounced by engineers and steel men as the most complete code of its kind that has been developed for any industry. In unmistakable terms it defines the rights of buyer and seller, and at the same time carefully safeguards the interests of both. It was prepared for the specific purpose of eliminating many of the sources of misunderstanding that have grown up in the industry, and members of the Institute feel that it will meet with the same generally favorable reception which has been accorded the Standard Specification.

The Institute was told at the convention that the Standard Specification has now been written into the building codes of twenty-five cities, and that its influence is being felt very strongly throughout the country. Not only are the economies which it makes possible commending it to architects, contractors, builders and the public generally, but its central theme of standardization is gaining for it an enormous following.

Announcements

Charles N. Whinston & Brother, architects, 2 Columbus Circle, New York City, have opened an office in the First National Bank Building, Mount Vernon, and this office will handle all Westchester County work in the future.

Albert B. Groves, architect, announces his removal from the Stock Exchange Building to Suite 2021 Railway Exchange Building, 6th and Locust Streets, St. Louis.

Daniel Wentworth Wright has been granted a certificate to practise architecture in the State of New Jersey, and wishes to announce that he is now associated with Kenneth Whitney Dalzell, A. I. A., in the general practice of architecture at Maplewood, N. J.

William Sevic, architect, announces the removal of his offices to 1829 Blue Island Avenue, Chicago, Ill.

The partnership of Martin & Ward, architects, was terminated July 31, 1925. Haskell H. Martin and William R. Ward, Jr., will continue their practice of architecture individually at their present offices in the Vickers-Cauble Building, Greenville, S. C.

Experience vs. Science

ENGINEERS are human and so are not exempt from the laws of psychology. President Coolidge in his inaugural address told us that "human nature is about the most constant thing in the universe."

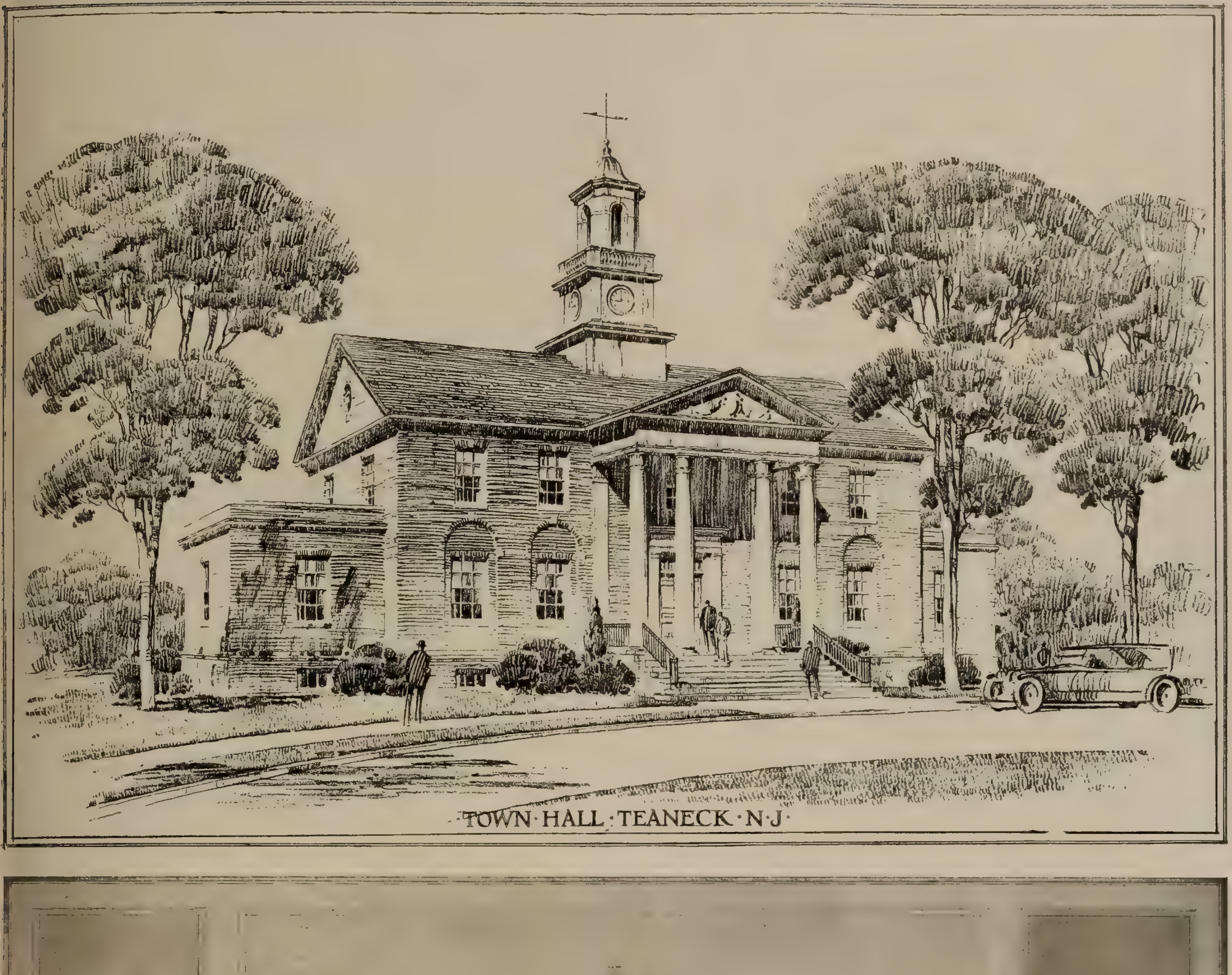
In construction, new materials are adopted slowly. This was necessary when only a long period of experience could prove the value of these materials. Even now, with the scientific methods of laboratory tests, which shorten the period of probation, engineers wait on general experience and consult general impressions rather than the data of science.

Thirty years ago concrete gradually replaced brick in sidewalks. American Portland cement replaced German cements.

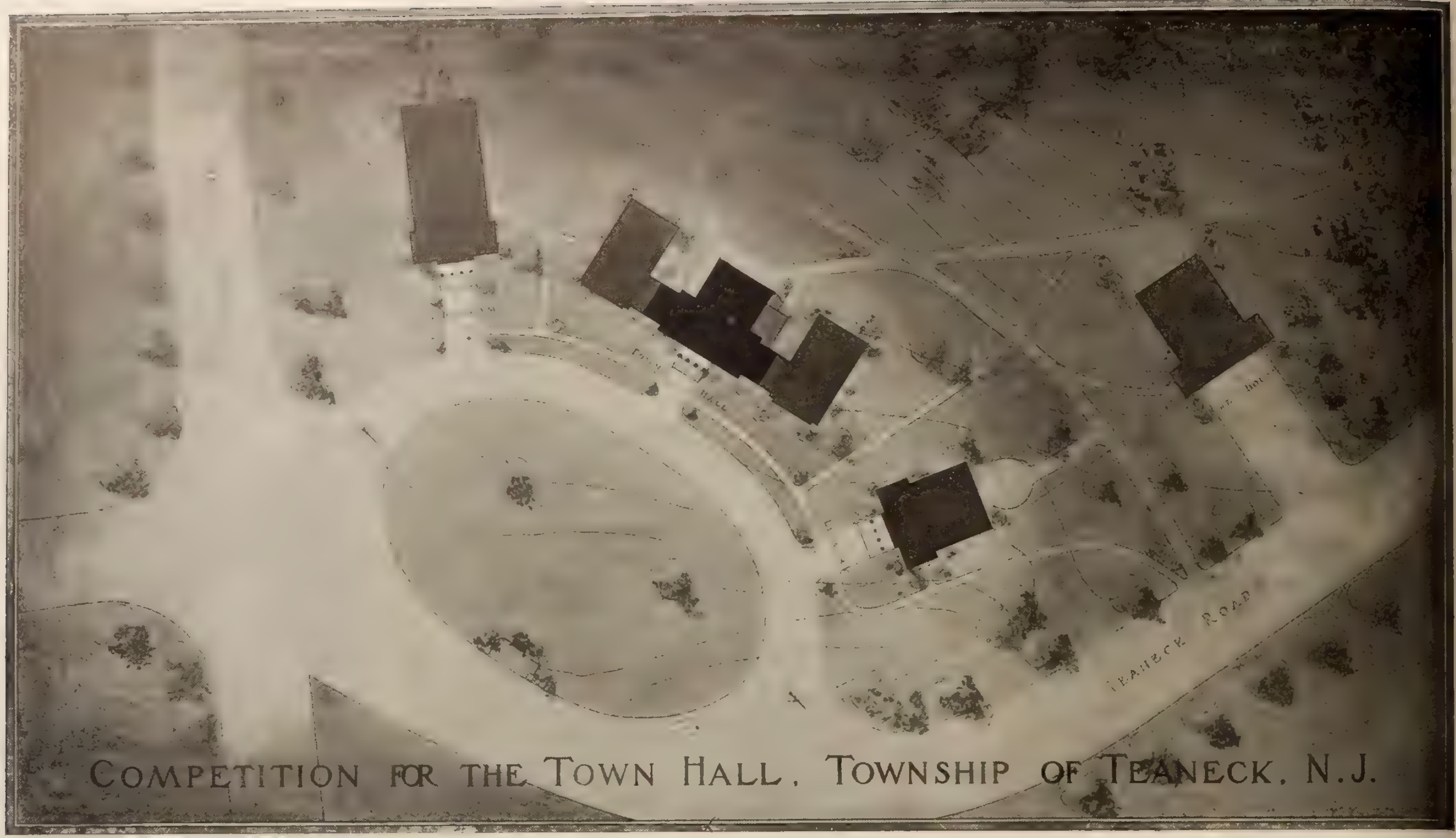
Forty years ago wrought-iron bridges were being built by engineers mistrustful of steel. Engineers were fearful of this strong and supposedly brittle material which was replacing the flexible wrought-iron beams.

Who does not remember that twenty years ago engineers accustomed to design structural-steel frames for buildings and bridges, with their positive metallic-rivetted connections, shook their heads in grave doubt about the permanency of reinforced-concrete frames with their loose bars held together only by a cementing medium? Now, buildings sixteen-stories high, and railroad bridges of forty-foot span are considered safe and conservative. In Europe, where materials are more expensive than in the United States, bolder designs with higher stresses are used.

Thus steel and reinforced concrete have won their way and are now the ordinary resource of the designer. No hazard is inherent in their use. Indeed, active movements are under way to increase the allowable stresses on these materials.



WINNING DESIGN. Ludlow & Peabody, Architects.


TEANECK ROAD
COMPETITION FOR THE TOWN HALL, TOWNSHIP OF TEANECK, N.J.

New Town Hall, Teaneck Township, N. J.

A COMPETITION for the selection of an architect for a new Town Hall has been decided in favor of Ludlow & Peabody. Designs were submitted in a competition limited to four firms of architects.

The programme carried the following conditions:

Site.—The site of the new Town Hall will be at the corner of Teaneck Road and Cedar Lane, Teaneck Township, N. J. A copy of the layout of the property has already been given to the competitors.

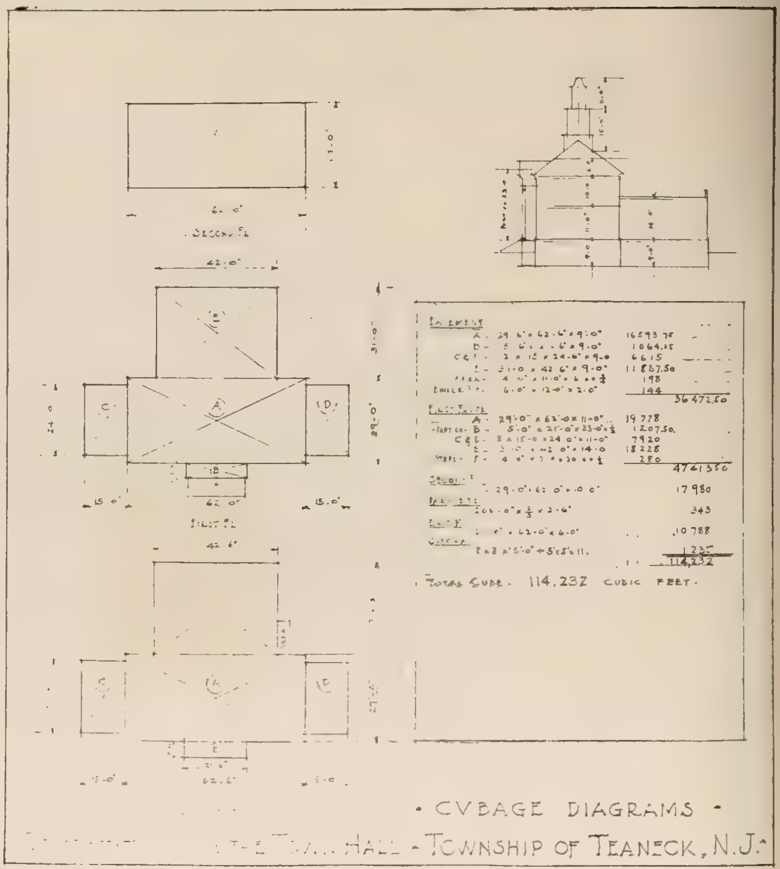
Cost.—For the purpose of this competition the cost of this building shall be figured at seventy cents a cubic foot, and the total figure on this basis shall not exceed $80,000. The materials to be used are subject to the individual choice of the several competitors, the only stipulation being that the building shall be of fire-proof construction throughout.

Cubage (*Mandatory*).—Cubage shall be so computed as to show as exactly as possible the actual volume of the building, calculated from the finished level, or levels, of the lowest floor to the highest points of the roofs, and contained within the outside surfaces of the walls. Pilasters, cornices, balconies, and other similar projections shall not be included. Porticos with engaged columns and similar projections shall be taken as solids and figured to the outer face of the columns. When columns are free-standing one half of the volume of the porticos shall be taken. There shall also be included in the cubage the actual volume of all parapets, towers, lanterns, dormers, vaults, and other features adding to the bulk of the building, also the actual volume of exterior steps above grade. Light wells of an area of less than 400 square feet shall not be deducted.

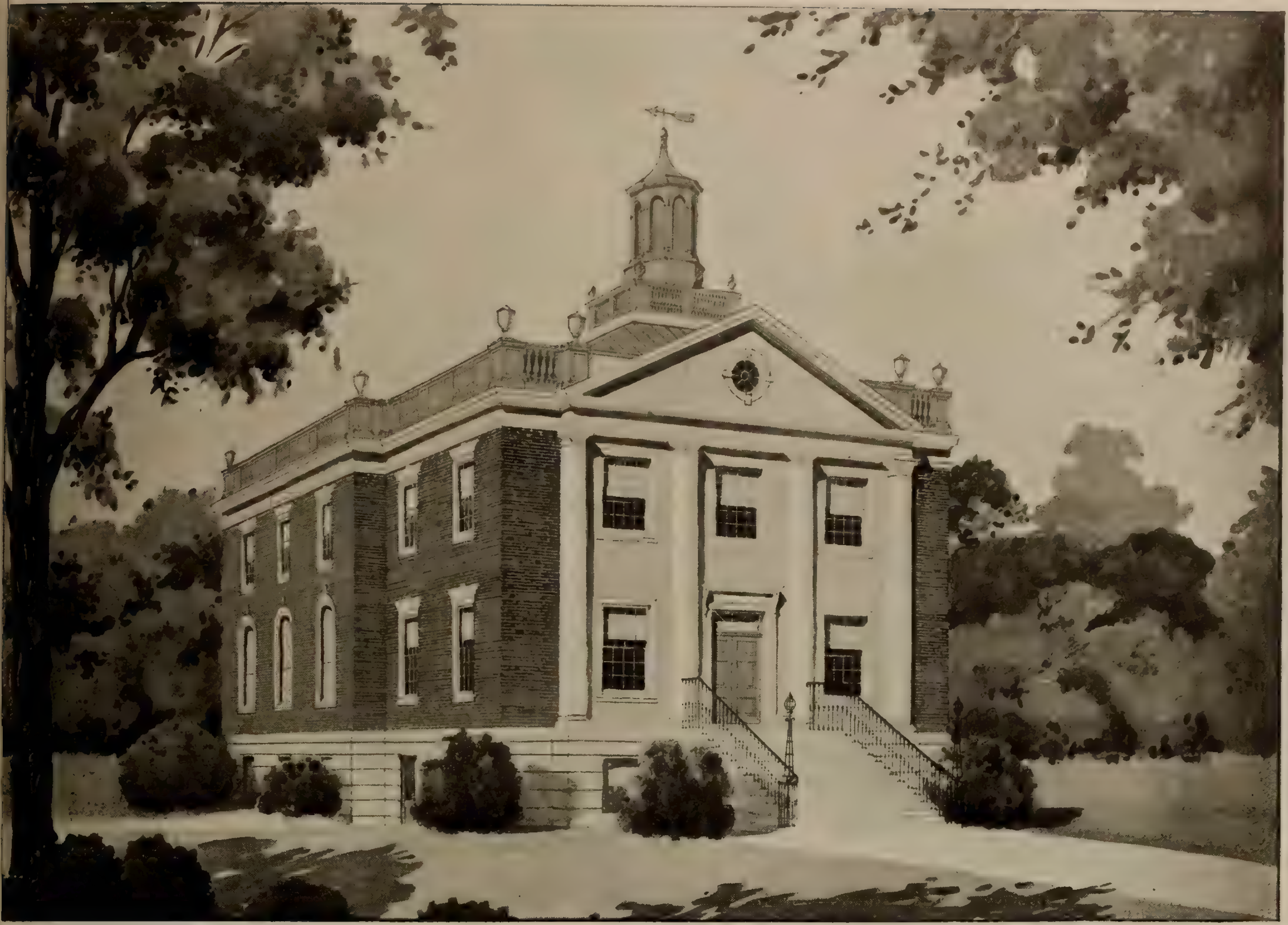
In calculating cubage, account shall be taken of variations in the exterior wall surface, as, for example, the projection of a basement story beyond the general line of the building.

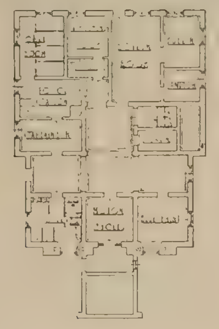
A figured diagram showing method adopted in cubing shall accompany each set of drawings.

Drawings (*Mandatory*).—Drawings submitted shall be


TOTAL CUBE - 114,232 CUBIC FEET
CVBAGE DIAGRAMS
TOWN HALL - TOWNSHIP OF TEANECK, N.J.

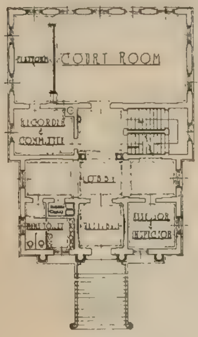
Ludlow & Peabody, Architects.





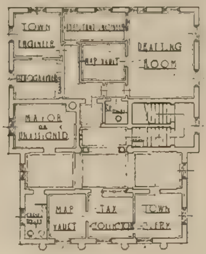
PLAN OF GROUND FLOOR

SCALE 1/8" = 1'0"



PLAN OF FIRST FLOOR

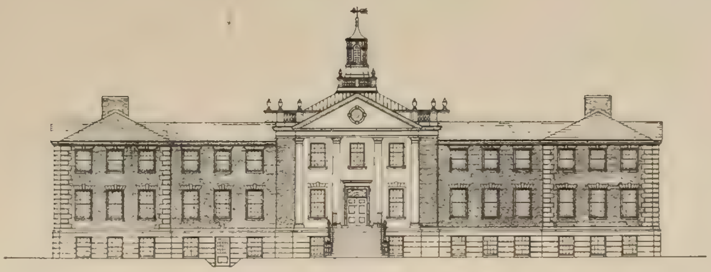
SCALE 1/8" = 1'0"



PLAN OF SECOND FLOOR

SCALE 1/8" = 1'0"

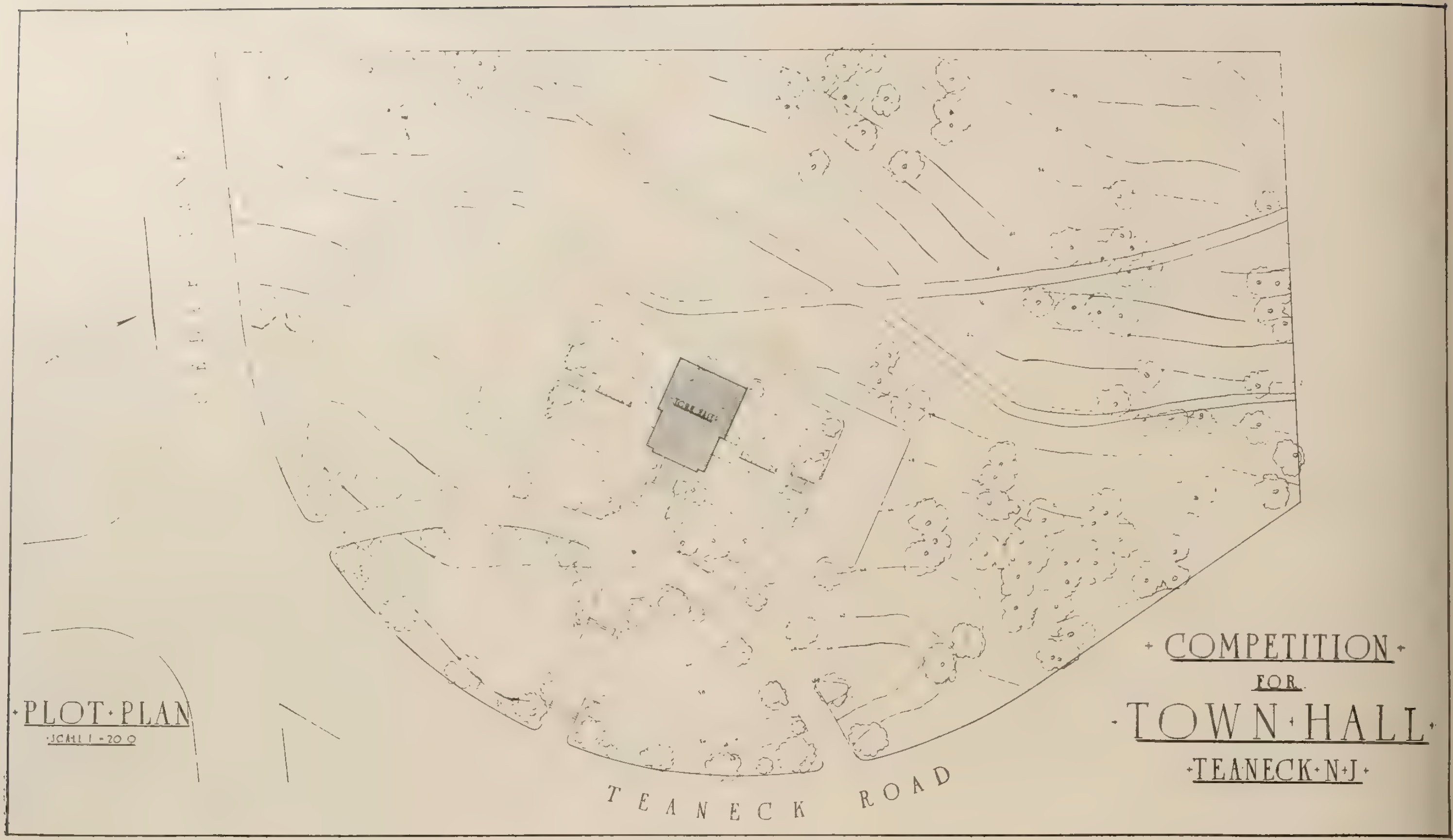
COMPETITION
FOR
TOWN HALL
TEANECK N.J.



FRONT ELEVATION

SCALE 1/8" = 1'0"

COMPETITIVE DESIGN. Dexter & Hacker, Architects.



according to the following list, at the given scale, and rendered as noted, and no other drawings than these shall be submitted:

Sheet No. 1.—Plot diagram of the entire plot with the complete building located thereon, showing the driveways, walks, parking space, etc. The wing to be erected should be clearly indicated. Scale —1/16″ equals 1′.

Sheet No. 2.—Basement plan of the wing to be erected at this time.

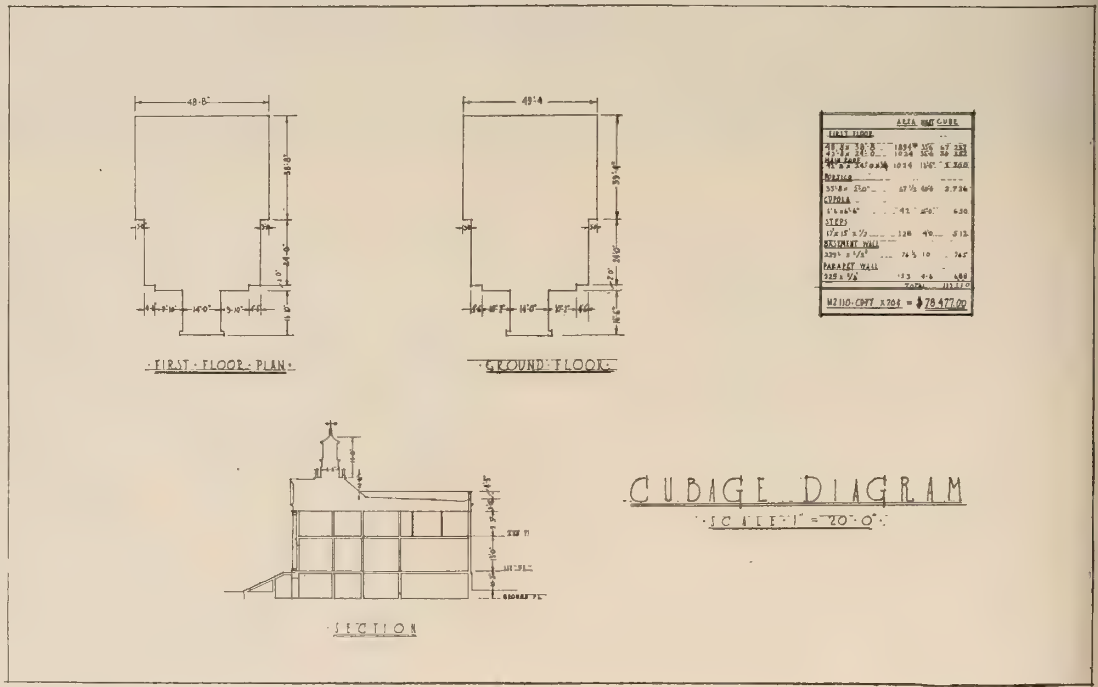
First floor plan of the same.

Second floor plan of the same.

Main elevation of the entire building.

All at 1/8″ scale; 1/8″ equals 1′.

Sheet No. 3.—Perspective of the wing to be erected at this time. Scale 1/4″ to the foot.



Competitive design. Dexter & Hacker, Architects.

The drawings shall be on white tracing paper, in pencil, and the perspective shall be on white Whatman paper, rendered in wash, all to be mounted on heavy cardboard mats. A mounted Whatman mat used for the perspective. The drawings shall be on sheets 30″ × 51″.

Sheet No. 4.—Cubage diagram showing dimensions and method of calculation drawn to 1′ scale.

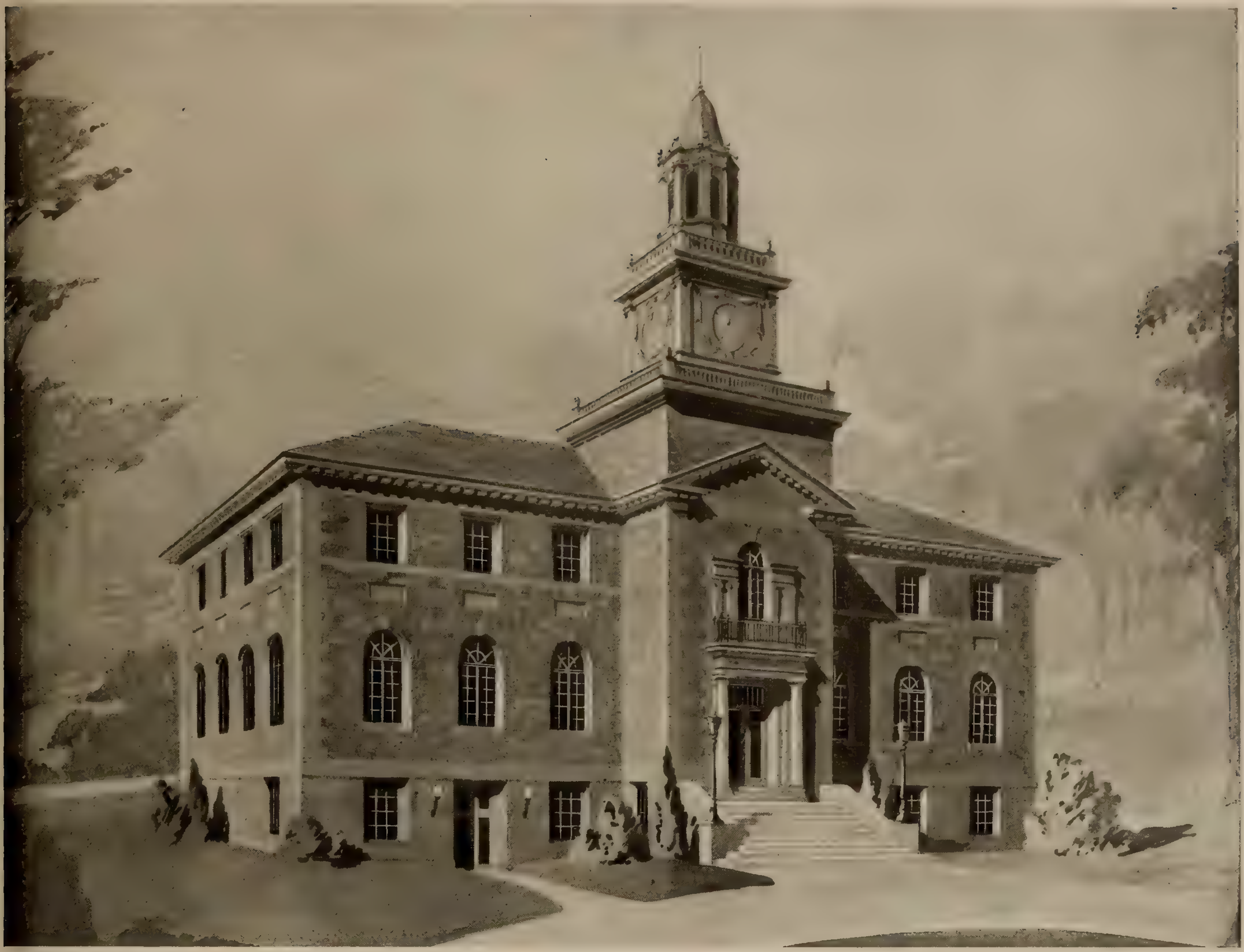
The Programme.—This programme in its entirety constitutes an agreement between the Commission on the one hand and each competitor severally on the other. It is understood, therefore, that each architect who submits a design in this competition thereby accepts the terms of the programme as binding upon him, both as to the said programme and any agreement that may grow out of it.

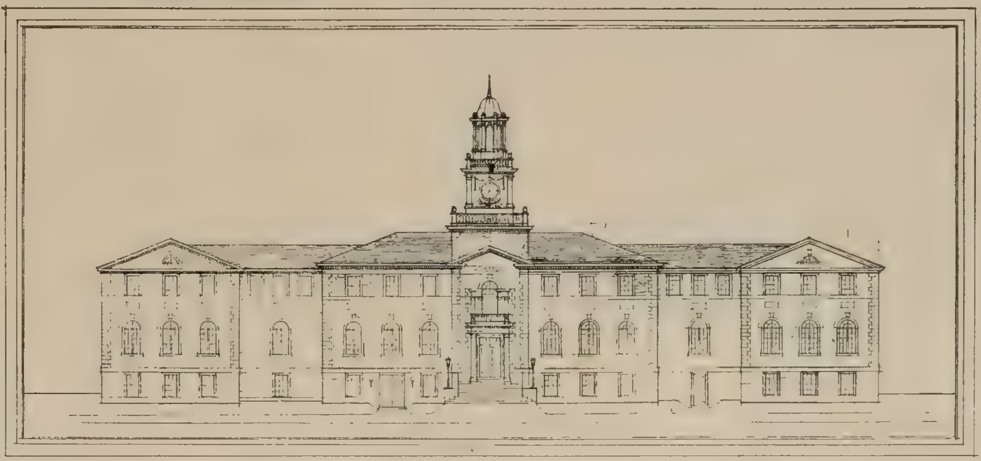
THE REQUIREMENTS

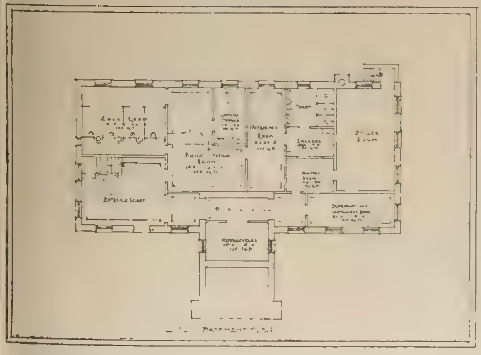
Basement.—This story should be entered without the use of steps from the ground level; either a ramp or advantageous use of the grades of the property should be employed. It shall contain besides the necessary boiler-room, coal-storage and stairs to the floors above, the following:

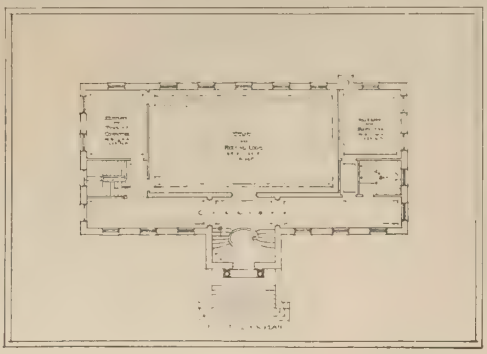
(*a*) Police Department with the:

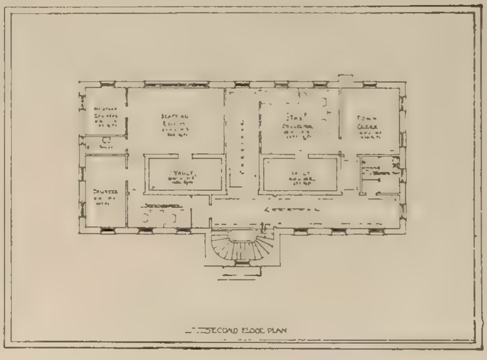
(1) Captain's office to accommodate a desk, filing cabinets, and a small safe;



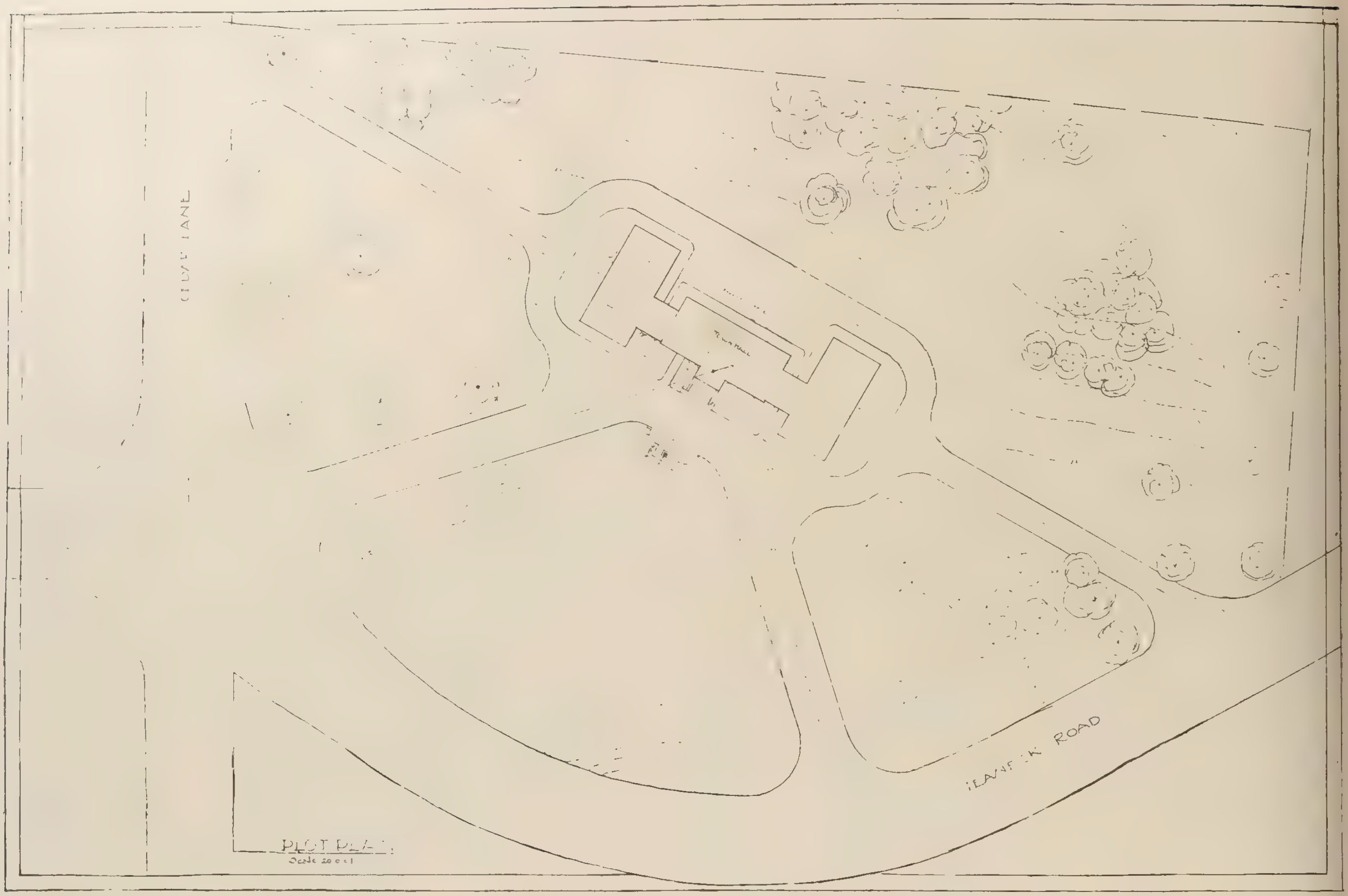


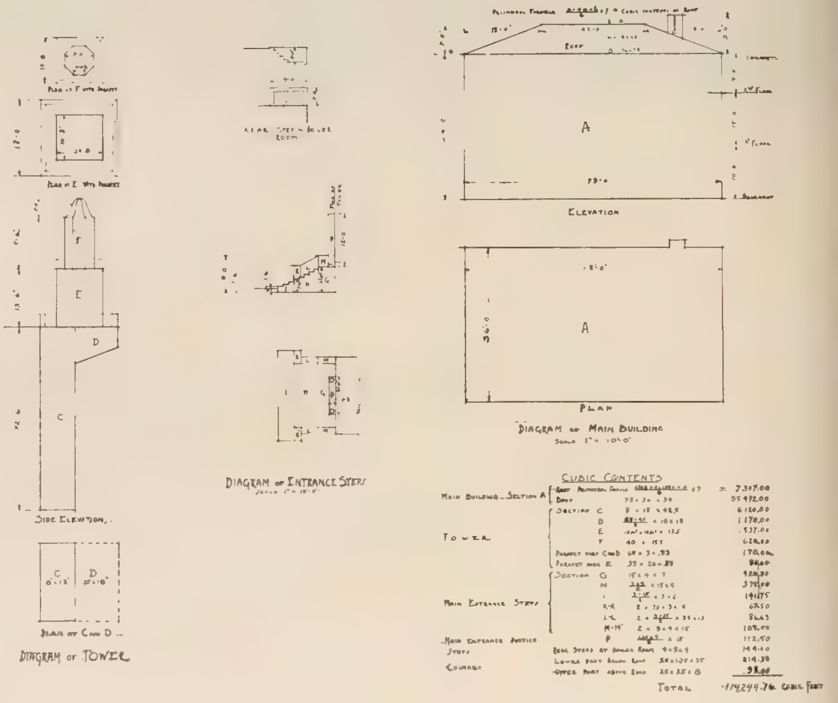






COMPETITIVE DESIGN. Beverly S. King, Architect.





Competitive design. Beverly S. King, Architect.

(2) Police station room adjoining and connected to the above by a doorway, and large enough to accommodate a desk and seats for patrolmen;

(3) Call room, so situated that it will be entirely under the visual control of the officer on duty in the station room, and of a size to contain four cells;

(4) Patrolmen's room, for men off duty; to accommodate a table, chairs, and cot for an officer who sleeps in the department;

(5) Locker-room, with accommodation for fourteen (14) lockers;

(6) Wash-room equipped with two (2) lavatories, two (2) urinals, two (2) water-closets and one (1) shower;

(7) Motorcycle-room to accommodate eight (8) motorcycles. This room may be entirely outside the main walls of the building, and placed under a terrace, portico, or other architectural feature, but should be in any case adjacent to the basement entrance.

(*b*) Janitor's room.

(*c*) Blue print and instrument room for the Department of Public Works, to contain about one hundred twenty (120) square feet of floor space.

First Floor.—This story shall have an entrance independent from that through the basement, and shall include besides the staircase the following rooms:

(*a*) Court and meeting room to have at one end a platform about 10′ × 20′, and with a seating capacity of at least 150 people.

(*b*) Office of the Recorder and Township Committee to be so located as to have direct access through a doorway to the platform end of the court and meeting room.

(*c*) Office of the assessor and Inspector.

(*d*) Public toilet for men.

Second Floor.—This story shall contain besides the staircase the following:

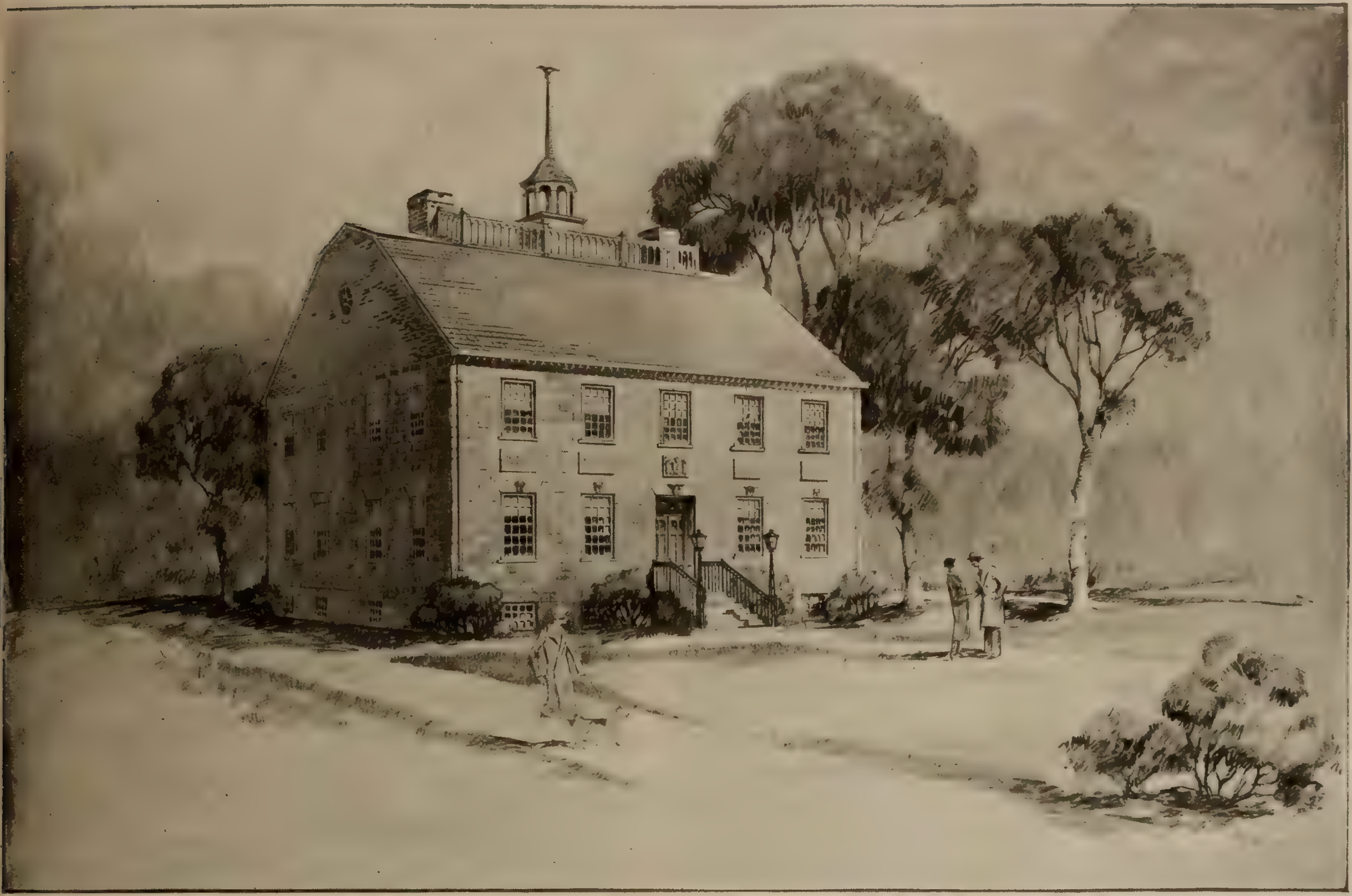
(*a*) Corridor of ample width.

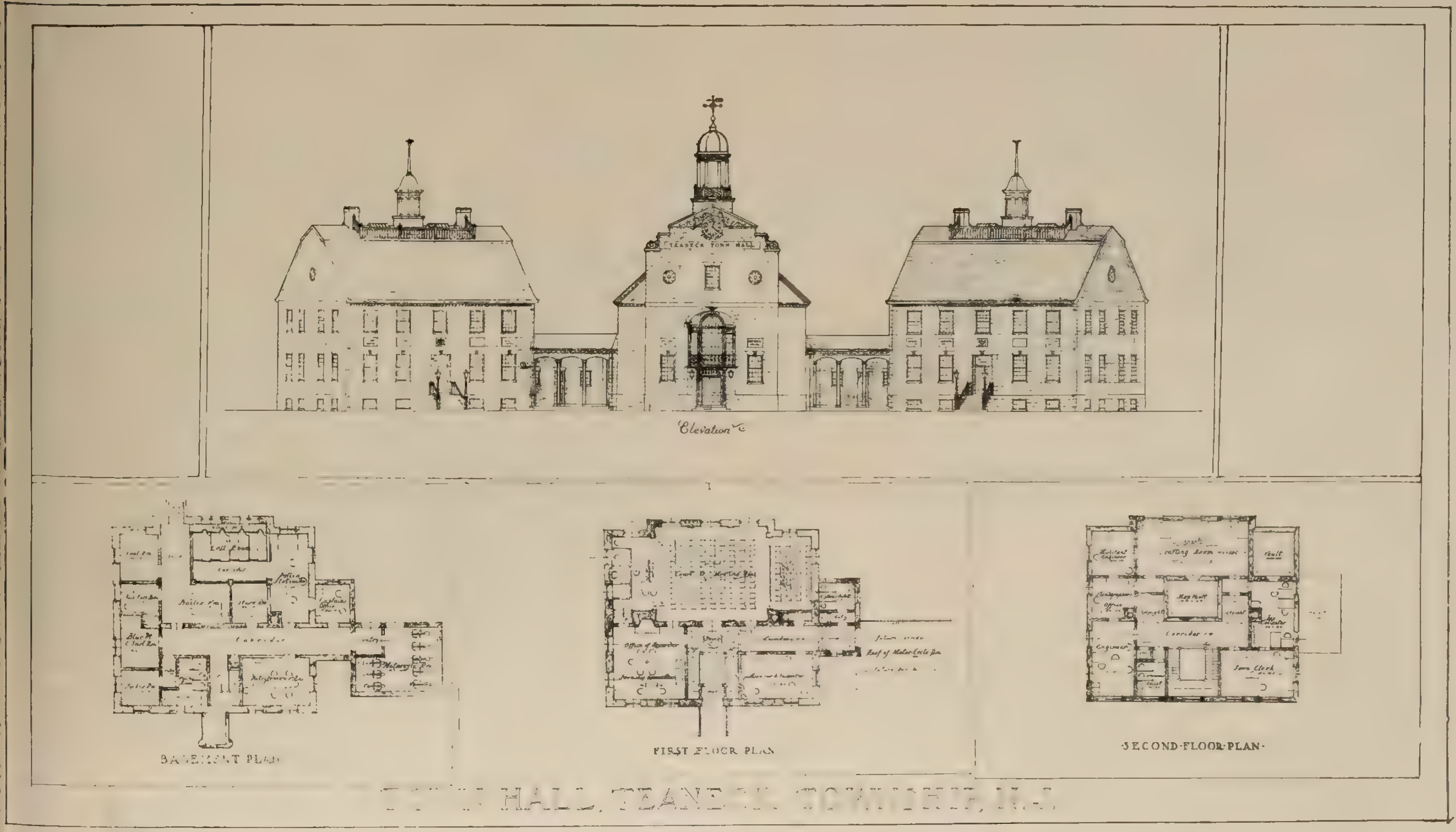
(*b*) Tax Collector's Department.

(1) Storage vault to contain about one hundred thirty (130) square feet floor space, and provided with a fire-proof vault door opening into the office.

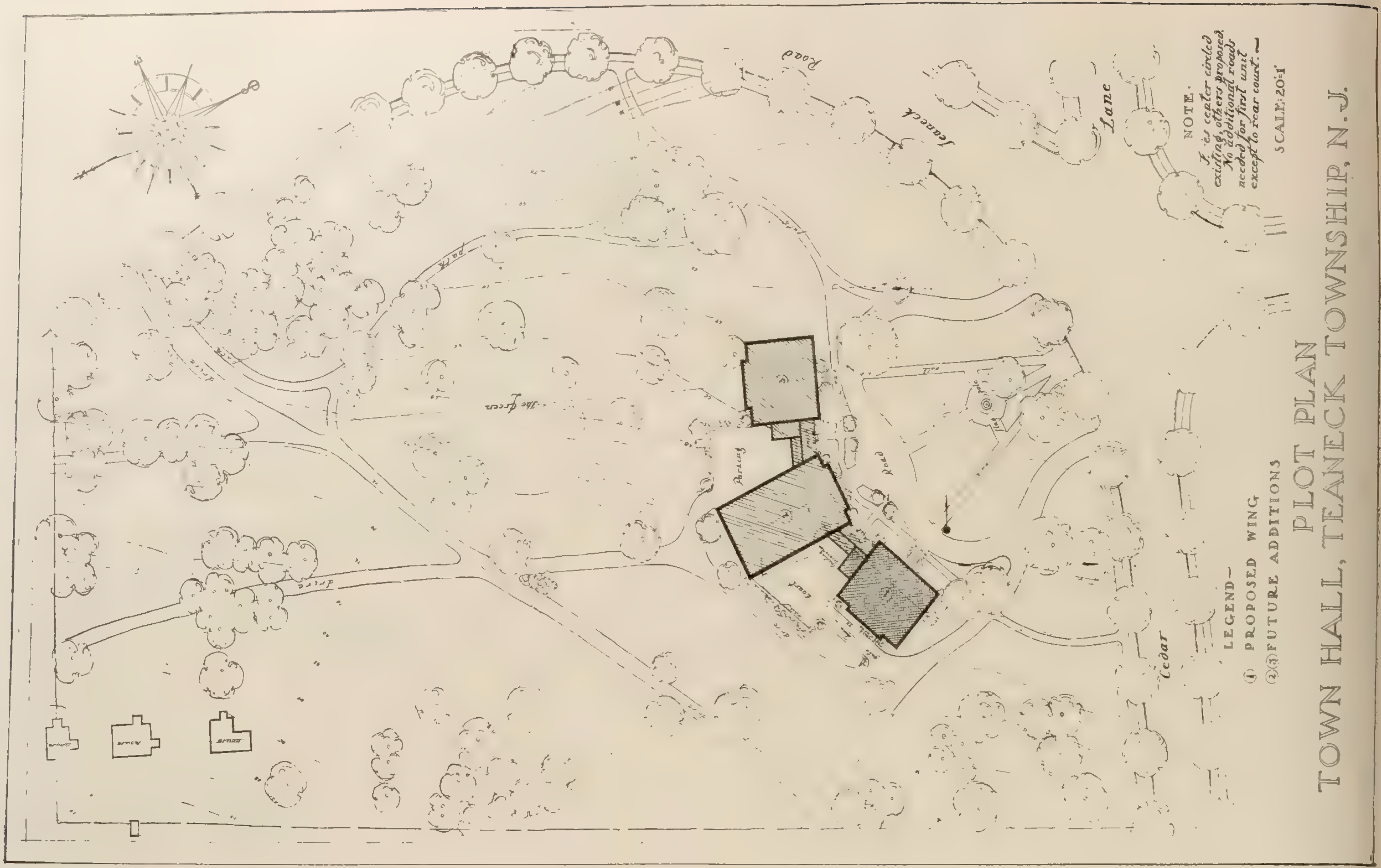
(2) Office of Tax Collector, to have windows for the public opening onto the corridor, with counter under; space for two desks, stenographer, small safe and table for records, to be located directly in back of the counter.

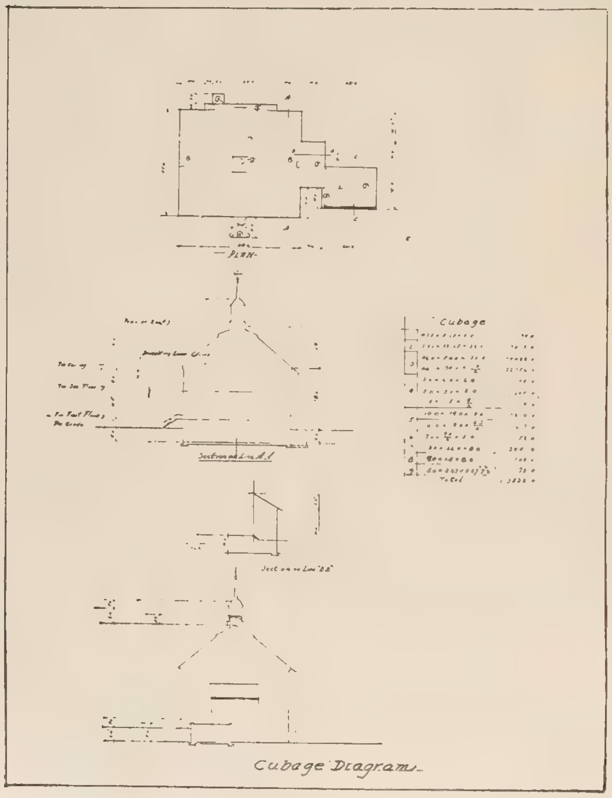
(*c*) Office of Town Clerk, to be located next to and connected by a doorway to the Office of the Tax Collector; to accommodate a desk, files, bookcase, and safe.





COMPETITIVE DESIGN. Coffin & Coffin, Architects.


Road
Teaneck
Lane
The Green
Parking
Road
Court
Cedar
NOTE.
T. is center circled existing, others proposed. No additional roads needed for first unit except to rear court.
SCALE: 20:1"
LEGEND—
① PROPOSED WING
②③ FUTURE ADDITIONS
PLOT PLAN
TOWN HALL, TEANECK TOWNSHIP, N. J.



Competitive design. Coffin & Coffin, Architects.

(*d*) Department of Public Works to comprise:

(1) Stenographer's office, so located that the public in entering the department must pass through it, and to contain about one hundred (100) square feet of floor space.

(2) Office of Township Engineer, to contain about one hundred fifty (150) square feet of floor space.

(3) Office of Assistant Engineer, to be located at one end of and separated from the drafting-room by a glazed wood partition, and to contain about one hundred twenty (120) square feet of floor space.

(4) Drafting-room to be at least 15′ wide and 20′ long, with a lavatory located in the same. This room shall be provided with skylights in addition to any windows, and located preferably for the use of north light.

(5) Map vault, to contain about one hundred thirty (130) square feet floor space, and provided with a fire-proof vault door opening into the drafting-room.

(*e*) Public toilet for women.

Agreement between Owners and Competitors.

(*a*) *Design.*—The architect is to design the entire building and its immediate surroundings, and is to design or direct the design of its constructive, engineering, and decorative work, and its fixed equipment and, if further retained, its movable furniture and the treatment of the remainder of its grounds.

The professional adviser was Mr. Hobart B. Upjohn. The jury of award consisted of Mr. Edward L. Tilton, Mr. Benj. W. Morris, architects, and Mr. Geo. W. Burpee, engineer; together with the local building committee.

Committee on "Cubing of Buildings, A. I. A."

REALIZING that differences now exist among architects, contractors, appraisal organizations, bonding companies, and others concerned with the size and approximate cost of buildings as to the methods used in determining the cubical contents of any structure, the American Institute of Architects has appointed a committee to ascertain, codify, and review the various methods now in use and prepare a report to the Scientific Research Department of the Institute.

Suggestions or information relating to this subject which will assist the committee and the industry will be welcomed. They should be sent to D. Knickerbacker Boyd, Chairman, 112 South 16th Street, Philadelphia, Pa.

An Architect's Simple Engineering Problems

By DeWitt Clinton Pond, M.A.

ELEVENTH ARTICLE

UNTIL recently masonry walls and piers have been used for supporting almost all kinds of permanent construction. During the last thirty years, however, steel has been employed more and more extensively until now steel columns or concrete columns reinforced with steel are about the only kinds of isolated supports found in large buildings. In many cases, even the walls below grade are simply retaining walls, and are not used to support floor beams, and the columns that occur along the building line are used to buttress these walls, so, instead of acting as supporting members, these walls are actually supported. Even in small residences masonry piers in the basement are superseded by cast-iron or steel columns filled with concrete, which take up much less room. It is this saving in space that is responsible for the almost universal adoption of steel or iron supporting members, or concrete reinforced by steel.

For the use of the architect who is not engaged in the design of large reinforced concrete or steel-skeleton buildings, the metal supports that are most apt to be used are those manufactured by such companies as the Lally Column Co., the Crex Patent Column Co., the Milford Iron Foundry, or others that supply a type of column made of a steel shell filled with concrete, which may be reinforced with rods, or angle-irons, and equipped with brackets to carry the wood beams or girders that are framed into it.

Each manufacturer supplies a list giving the carrying capacity of the columns in terms of the diameters and heights, and as a rule these are approved by the building inspectors, so that the engineering design of such columns is a very simple matter. It will be noticed that the height of the column is an important factor. This matter will be discussed more thoroughly when the design of steel columns will be considered.

Suppose, in a country residence, there were a floor area of a living-room measuring 26 feet by 14 feet, one half of which was carried on the foundation wall, and one half on two girders framing into a column of the type referred to above. The girders run the long way of the living-room, and each has a clear span of 13 feet. A diagram showing this condition is shown in Fig. 22.

It is customary to allow 60 pounds for the total dead and live load where the ordinary type of residential construction is used, so, if the area of the floor which is carried by the column is determined, the load which the support must carry can be found by multiplying the area in square feet by 60 pounds.

As far as the living-room floor is concerned only one quarter of the load will rest on the column, as one half is carried by the wall paralleled with the longest dimension of the room, and one quarter will be carried by the girders to the end walls. In other words, the area of living-room floor carried by the column will measure 7 feet by 13 feet, and will contain 91 square feet. This will weigh 91 × 60 = 5,460 pounds. Another girder frames into this column. This girder carries part of the dining-room floor, and the area of floor that is supported by the column is 7 feet by 6 feet 6 inches, 7 × 6.5 = 45.5 square feet, which will weigh 45.5 × 60 = 2,730 pounds. The total of these loads is 8,190 pounds, and if the weights of the girders themselves and the additional load of the framing around the stair well are added, the total first floor load carried by the column will be 7,000 pounds, or $3\frac{1}{2}$ tons. The partition which forms one side of the living-room, and which rests upon the two girders, is a bearing partition, and carries the second floor beams, which are framed parallel to and directly over the first floor beams. Therefore this will add another $3\frac{1}{2}$ tons to the load on the column, which will make a total of 7 tons. Roof framing rests upon the outside walls, and with the exception of the ceiling beams no additional load bears on the second story partitions. Two tons more should be added for the load of the attic floor, making a total of nine tons. It might be well to note that if the second floor framing were very different from the first, it would have been necessary to determine the actual loading carried by the various partitions, and then to find how these loads were carried to the first floor girders, and thence to the columns. This would require some lengthy calculations, and it is doubtful if the ordinary conditions would be such as to make close calculations necessary, as will be shown.

The height of the cellar in this residence is 8 feet from floor to floor, and the height of the column can be considered as 7 feet. By referring to the tables of safe loads for columns of this style, which are furnished by the manufacturers, or which can be found in "Sweet's Architectural Catalogue," it will be seen that a $3\frac{1}{2}$-inch diameter column with an unsupported length of 7 feet will carry 10 tons, or 10 per cent more than the loading that will actually rest upon the support. Therefore, a $3\frac{1}{2}$-inch column—the one having the least diameter of any manufactured—will be more than large enough to carry the floor loads that will rest upon it.

From this it can be seen that for ordinary residential buildings, in which the spans are about the same as those given above, it is hardly necessary to carry out a set of complicated calculations. For ordinary conditions a $3\frac{1}{2}$-inch column is large enough, and if spans become larger a 4-inch column, which, for this height, carries 13 tons, is more than strong enough.

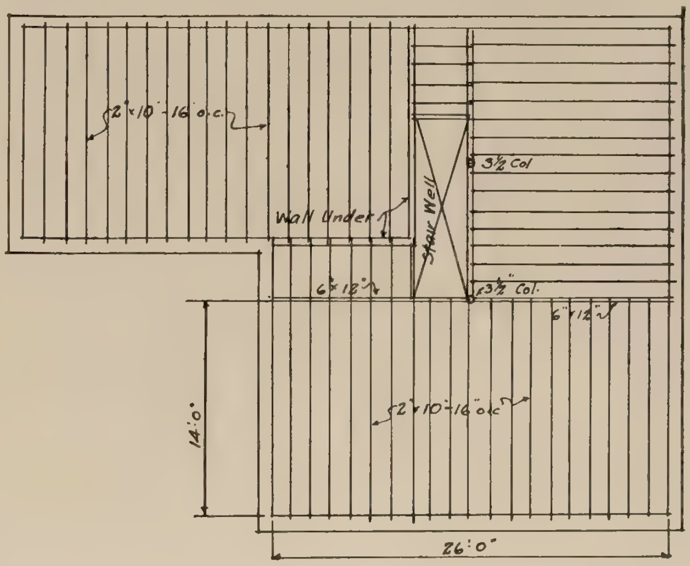


Fig. 22

Of course, if columns of this type are used in mill construction, where the floor construction itself is much heavier and the live loads are more than three times as heavy as in residential work, all loads must be carefully calculated, and the heavy weight type of columns will probably be required. When such conditions are encountered an experienced engineer should be commissioned to design the supporting members.

Columns of the type referred to above are not often used where it is necessary to carry them to any height, as it is difficult to make rigid connections. For this reason where steel beams frame into columns it is usual to employ steel sections, which can be riveted or bolted.

Steel columns can be fabricated out of plates and angles, or channels, or they can be of the type supplied by the Bethlehem Steel Company, which require no fabrication except where unusually heavy loads are to be carried, when it is necessary to reinforce the ordinary shapes by means of plates.

When steel columns are to be designed a factor known as the "radius of gyration" enters into the calculations. This term is even more difficult to understand than the moment of inertia referred to in the article on beam design. To attempt to define the radius of gyration would result in a combination of words that would be practically meaningless, but as it is doubtful if even experienced engineers can explain what is meant by this term, there is no reason why an architect who only requires a working knowledge of design for simple problems, should worry about such a definition.

The practical use of such a factor, however, is another matter. By referring to the "Catalogue of Bethlehem Structural Shapes" it can be seen that in tables of dimensions and properties of H columns, the radius of gyration is listed in the same manner as are the area, weight, and dimensions of each section. If it is desirable to find the *least* radius of gyration of an 8-inch, 72-pound H section, it is only necessary to look in the table in the catalogue, and under the heading "Radius of Gyration—r′—Axis Y Y," to find this factor listed as 2.12.

The reason for the need of knowing the radius of gyration is that almost every building code states the allowable loads on steel columns in terms of the unsupported length of the column divided by the least radius of gyration. As an example, in the New York Building Code, Article 3, Section 52, the following working stresses for steel columns are given in paragraph 4, in pounds per square inch of cross section when the length divided by the least radius of gyration equals:

120	7,600	pounds
110	8,300	"
100	9,000	"
90	9,700	"
80	10,400	"
70	11,100	"
60	11,800	"
50	12,500	"
40	13,200	"
30	13,900	"
20	14,600	"
10	15,300	"

If the 8-inch, 72-pound H section is to be used for a column having an unsupported length of 11 feet, in order to find what the safe working stress over the area will be, it is necessary to divide 132 inches by 2.12. $132 \div 2.12 = 62.2$.

For the ratio of 60 the allowable stress is given as 11,800 pounds per square inch, and for a ratio of 70 the stress is 11,100. By proportion it can be found that the allowable stress for a ratio of 62.2 is 11,642 pounds. By again referring to the catalogue it can be found that the area of the column is 21.05 square inches, so the carrying capacity of this section for a height of 11 feet is:

$$21.05 \times 11{,}642 = 245{,}000 \text{ pounds.}$$

It might be well to note that the stresses arrived at in the New York Code are derived from a formula given below, and which is the same as used in Chicago and St. Louis. This formula is $f_s = 16{,}000 - 70\frac{l}{r}$, in which 1 is the unsupported length in inches, and r is the least radius of gyration.

If it were desirable to use the formula in the problem given above, the calculations would be as follows: $l = 132$ inches; $r = 2.12$; $l/r = 132 \div 2.12 = 62.2$; $70 \times 62.2 = 4{,}354$; $16{,}000 - 4{,}354 = 11{,}646 = f_s$.

The stress arrived at is practically the same in either case, and would be exactly the same if the calculations were carried further beyond the decimal point.

There are a few considerations that may be worth some attention. From the formula it is apparent that the stress on the steel can never equal 16,000 pounds per square inch, which is the safe compression as well as the safe tensile stress in steel. This is due to the fact that in columns there is danger, not only of crushing, but of bending, and as the height becomes greater this tendency increases. Therefore the allowable stress decreases.

The radius of gyration is given in the Bethlehem catalogue for the H sections, and in the Carnegie "Pocket Companion" for certain fabricated sections, but if a special section is required, this factor must be determined by means of somewhat lengthy calculations, an explanation of which is given in the author's book, "Engineering for Architects."

The ratio $1/r$ is often called the slenderness ratio, and this in most cities must not exceed 120. A column with the same section, but twice as long as the one given in the problem, would not be allowed in New York.

The problem that was given is not exactly the kind that the architect is usually confronted with. Usually the loads that rest upon columns are determined first, and the column must then be designed to carry the load. When the architect has no table of safe loads on columns in front of him, he must assume the probable allowable stress, divide the load by this amount, find the area of steel in the section, and look up the section that will provide such an area. He must then check his results to see if the section has a proper radius of gyration, and if the assumed stress is the correct one. After a little practice it is not difficult to make some very close assumptions.

Color Effects in Slate

SLATES differ in color, and some colors are much more in demand than others, the preference being based more on tradition than on artistic taste or actual qualities of the slates, states Oliver Bowles, mineral technologist of the Bureau of Mines, who has completed a study of the technology of slate for the Department of the Interior. A wider market for colors not now in demand depends, therefore, on the cultivation of public taste, states Doctor Bowles. Architects and builders can widen the field of utilization of roofing slate by judicious efforts to popularize new colors or combinations of colors.

Slates are classed as fading or unfading according to their color stability. The fading of green slates is probably due to the presence of iron carbonate, which seems to be present not as pure siderite but as an isomorphous mixture of the carbonates of iron, lime, magnesium, and possibly manganese. The hydrous iron oxide formed by decomposition of the carbonate through action of certain solvents carried in rain-water destroys the green color and causes fading. The black and gray slates usually contain small amounts of such constituents, and are therefore nearly permanent in color. Bluish slates commonly turn grayish, and red slates may turn brown. The green slates are the most uncertain; some are practically permanent in color, but others fade and discolor badly.

A moderate and uniform fading may not be detrimental, but may produce a more pleasing effect, though in replacing broken slates it may be difficult or impossible to match the colors. Non-uniform fading results in spots or streaks, and is undesirable. The formation of some spots is due to the weathering of grains of the iron sulphides, pyrite, or marcasite.

Spots and blotches are very objectionable in slates. Many of the red and purple slates contain pale-green spots, some bordered with purple. The spots range in size from minute specks to spots two inches or more across, some are circular or oval, and others are irregular. In places the spots form bands or ribbons.

It appears that the pale-green spots in the red and purple slates are due to chemical changes caused by the decay of organisms embedded in the clays from which the slates were formed.

Finds Aluminum Paint Makes Radiators Less Efficient

THE aluminum or bronze paint generally applied to radiators greatly reduces their effectiveness and makes it necessary to have a larger surface for the same heating effect, according to experiments performed by Doctor W. W. Coblentz, of the Bureau of Standards. Doctor Coblentz finds that the heat radiated from an aluminum-painted radiator surface is less than a third of that emitted by a radiator of the same size painted with a non-metallic paint, enamelled, or simply allowed to rust.

On the other hand, he finds that aluminum paint is a very effective means of reducing the amount of heat transmitted through a thin material. Applied to the under side of a tent or awning, it reduces by three-fourths the amount of heat from the sun which gets through the cloth, while if used on the cover of an automobile or ice-wagon it cuts in half the heat let through and makes the temperature inside the vehicle more nearly that found in natural shade, thereby making it much more comfortable.

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The Rural Mail Service Has Put an End to Isolation and Ignorance of National Affairs

FEW institutions in the history of American progress can be credited with a more salutary effect upon the march of that progress than the Rural Mail Service of the Post Office Department.

No other single instrumentality has done more than the Rural Mail Service toward "bringing the city to the country" and relieving the prosaic existence of farm life, or has been as effective in establishing closer contact between the farmer and his markets. It has been the most important factor in making agriculture an exacting business instead of its one-time precarious classification which conveyed no broader meaning than "tilling the soil."

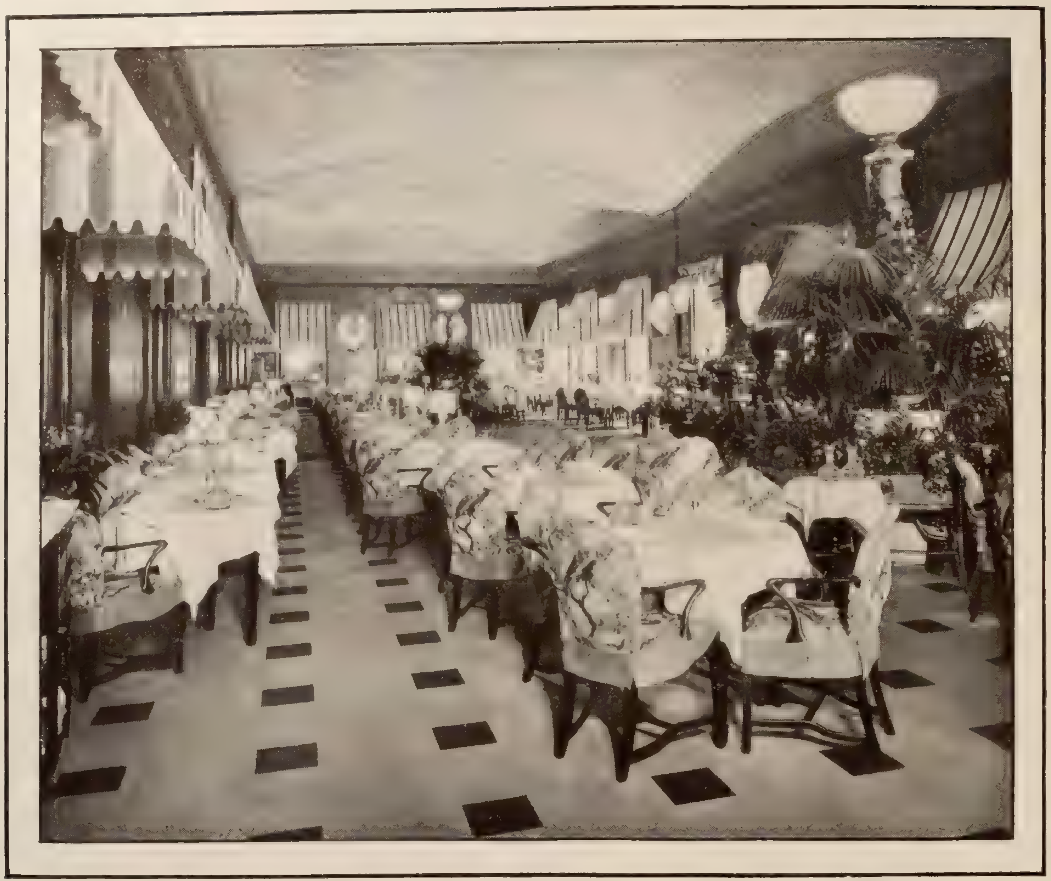
Twenty-nine years ago the farmer, and his wife and children, led an existence of almost complete isolation, living upon widely scattered farms, some of them miles apart. They had comparatively little communication with their neighbors or the outside world, except that derived from weekly trips to the adjacent village. More often than not the farmer lost a full day's work and his crops were neglected in order to obtain expected mail at the village post-office.

In those days the farmers' mail consisted largely of communications from relatives and friends. To-day the daily mail includes, usually on the very date of publication, the metropolitan newspaper, containing market reports and agricultural news; the weekly and monthly farm journals and magazines, and business letters from the village merchant and the more pretentious establishment in the distant city. All of these are now brought to his door, or to the box a few yards away.

The rural carrier is the farmer's post-office and his agent. Through him he conducts transactions for the sale of his live-stock, grain, and other farm produce. From him he buys stamps and pays his bills by postal money order. In short, the letter carrier is the medium that has transformed the once secluded habitant of the rural district into a cosmopolitan citizen conversant with current affairs and occupying a larger place in the destinies of a great nation.

Smithey & Tardy, architects and engineers, wish to announce that Mr. Herbert Johnson Burke has become a member of the firm and will be associated with them in the general practice of architecture at 112 Kirk Avenue, West Roanoke, Va.

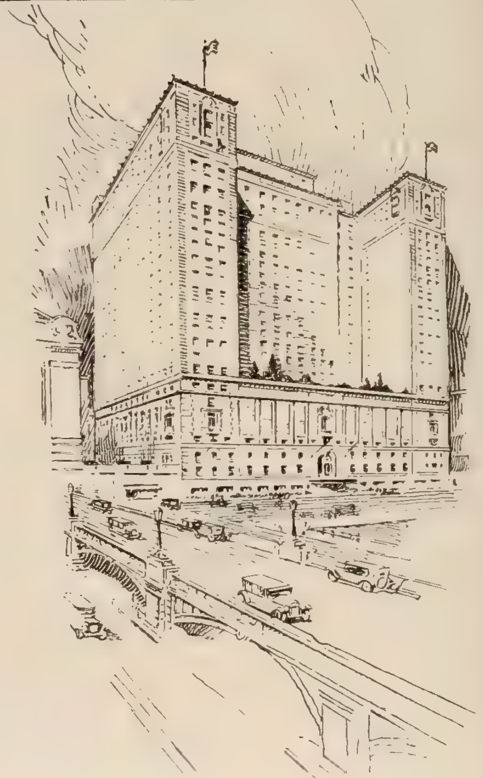
Mr. Burke attended the Virginia Polytechnic Institute, taking a preliminary course in civil engineering, and is a graduate in architecture from Columbia University, afterward doing research work abroad.



Main dining-room of the Hotel Commodore, New York.

Tiles the color of old ivory with here and there, for the sake of contrast, a single square of jet black, harmonize subtly with the unusual decorations of this sumptuous room.

In the Hotel Commodore—



Enter the main dining-room of the Hotel Commodore, New York City. How subtly the cool, comfortable-looking floor, of *Gold Seal* Treadlite Tile, enhances the detail of the decorative scheme! How restfully it cushions the shock and absorbs the sound of your footsteps!

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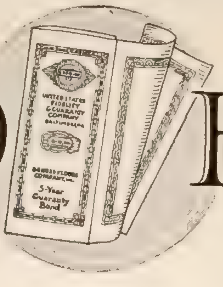

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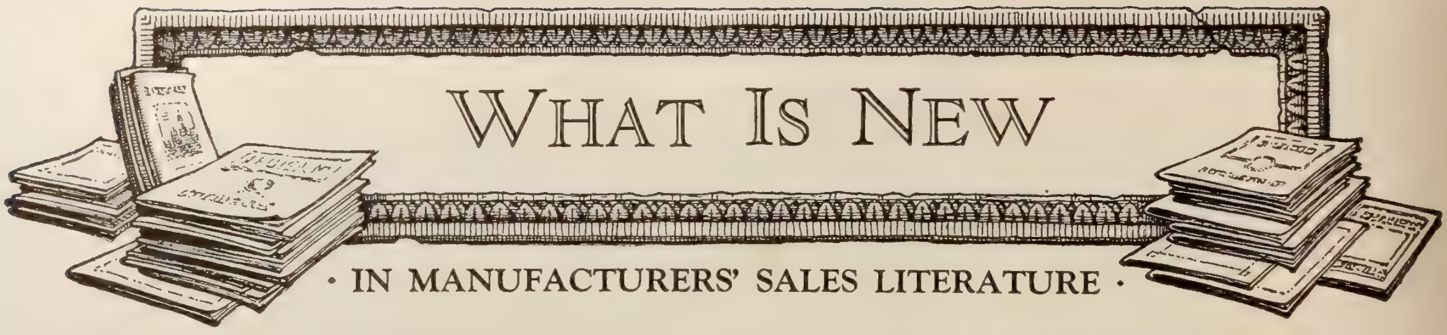


WHAT IS NEW

· IN MANUFACTURERS' SALES LITERATURE ·

Architects and every one interested will find here the latest and most up-to-date information on building equipment. These publications may be had by addressing SERVICE DEPARTMENT, ARCHITECTURE, 597 Fifth Avenue, New York, or by addressing the companies listed below, in which case please mention ARCHITECTURE

WHITNER SAFETY DEVICES

New pertinent facts have been issued by Ainsworth Buck, 20 Vesey Street, New York, for the protection of window-cleaners.

The book on "Whitner" devices offers information which the architect will find of value in his designing and writing of specifications.

GENERAL ELECTRIC CO., SCHENECTADY, N. Y.

The panelboards listed in a bulletin are sufficiently varied in construction and application for any lighting, and most small power requirements of the modern commercial building, industrial building, hospital, hotel, apartment-house or private residence. Where the electrical or architectural requirements of a building structure necessitate some unusual arrangement or construction which is not listed in this publication, the nearest office of the company can be consulted for additional information.

ELEVATOR SUPPLIES COMPANY, HOBOKEN, N. J.

"E-S Elevator Door Closer and Positive Electric Interlock" contains a description of these two controls, including a valuable set of detail drawings. The Positive Electric Interlock cuts off power while the doors are open, and therefore makes it impossible for the operator to start the car while passengers are entering or leaving.

Elevator accidents can be practically eliminated by the use of these safeguards.

The architect will find this booklet of value for reference. It is the result of over thirty-five years of manufacture of accessory apparatus to keep pace with the high standard demanded in modern elevator installation.

BUILDING CONDITIONS IN NEW YORK

The New York Building Congress has issued for the attention of architects a valuable résumé on building conditions in New York during the summer, 1925, also a leaflet on "Suggestions to Owners and Architects on Winter Construction."

STANDARD SPECIFICATION FOR STRUCTURAL STEEL

Some of the most prominent authorities on structural design in this country have brought about uniform practice in the structural steel industry by the adoption of a rational basis of design.

The standard specification can be incorporated in the building code requirements of any community.

The book is serving as a guide for the architectural profession.

DO WE BUILD TO BURN?

Of striking interest is a recent issue of "Safeguarding America Against Fire," published by the National Board of Fire Underwriters, which lists in detail the amazing and preventable fire loss in the United States during 1923.

The tabulation of the Actuarial Bureau of the National Board of Fire Underwriters for the year 1923 reports the value of fire-consumed property at $535,372,782, an average of $1,466,775 daily, or $1,019 a minute. Also the fire loss in America during 1903 was $145,302,155. This preventable waste has increased 269 per cent during a period of twenty years, in spite of many commendable efforts to raise the standard of building construction through the enactment of laws and ordinances.

LUMINAIRES FOR BUILDING

In their new catalogue the Edwin F. Guth Co., St. Louis, show a large and varied assortment of luminaires suitable for practically every type of building. Many of the types illustrated are new and have never before been catalogued. For convenient reference this catalogue has been arranged, as far as possible, to enable a selection of fixtures of various types from adjoining pages. For example, standards and outside lanterns are shown, and near them will be found luminaires suitable for public buildings, hotels, banks, office buildings, etc. Gothic, Romanesque, and other types for churches will be found in another section.

ELIMINATION OF WASTE

Under this head the Department of Commerce has issued a number of bulletins of exceptional interest. They include information on

"Eaves-trough, Conductor Pipe, and Elbows and Fittings."

"Hot-Water Storage Tanks."

"Terneplate."

"Concrete Building Units."

Another interesting subject is the "Theory and Interpretation of Experiments on the Transmission of Sound Through Partition Walls."

CONSTRUCTION PROJECTS ABROAD

CONSTRUCTION OF ART GALLERY FOR CEYLON

Plans have been drawn for an art gallery to be erected in a city in Ceylon. The completed building will consist of three wings devoted to (1) fine arts, (2) applied arts, and (3) music and drama and a library.

AUTHORIZATION OBTAINED FOR A LARGE HYDRO-ELECTRIC PROJECT IN CANADA

Authorization has been obtained for the development of 400,000 horse-power on the Ottawa River, from Rocher Fendu Rapids to Carillon Rapids, a distance of about twenty-eight miles. The project, it is estimated, will entail an expenditure of $20,000,000. This will be one of the largest power projects ever undertaken in Canada.

PROJECTED CONSTRUCTION IN CANADA

Construction projects in Canada, as reported by Assistant Trade Commissioner Walter J. Donnelly, Ottawa, include the following: Construction of a $2,500,000 mill; the erection of a 1,000,000-bushel capacity elevator; and the construction of a factory building to cost $1,000,000.

HOUSING PROGRAMME FOR A FRENCH CITY

As a result of the housing crisis, the city of Lyons has taken steps for the construction of a large number of simple dwellings which can be built at low cost, Consul Hugh H. Watson, Lyons, informs the Department of Commerce. Under this plan 192 dwellings were occupied at the end of 1924, 299 will be ready by the end of 1925, and 2,341 are to be constructed in an indefinite period of time.

INFORMATION ON PAINTS

Toch Bros., Inc., have available the following literature of interest to architects:

"'R. I. W.' Steel Preservative Paints."

"The Scientific Selection of Preservative Paints and Compounds."

"Shall Anything be Added to Portland Cement?"

"Scientific Paint, Varnish and Enamel Selection Chart."

"The Solution of a New Waterproofing Problem."

"Cement and Mortar Colors."

"Colored Integral Hardener for Concrete Floors."

"'R. I. W.' Cement Floor Enamel."

"'R. I. W.' Damp Resisting Paint and Specialties."

"Damp-Proofing Exposed Masonry Walls Above Grade."

"'R. I. W.' Hospital and Laboratory Enamel."

"Cutting Costs on Repainting."

STANDARDS IN THE PUMP INDUSTRY

The third edition of "Standards of the Hydraulic Society" has just been issued. It contains not only the information embraced in the earlier editions, but also much new and valuable data, such as a standard classification of pumps; standard nomenclature and definitions pertaining to the industry; standard dimensions for cast-iron flanges and cast-iron flanged reducers for 125-pound and 250-pound steam pressures, as adopted by the A. S. M. E.; and a very complete list of chemicals and other special liquids, specifying the materials recommended in the construction of pumps for handling these special liquids.

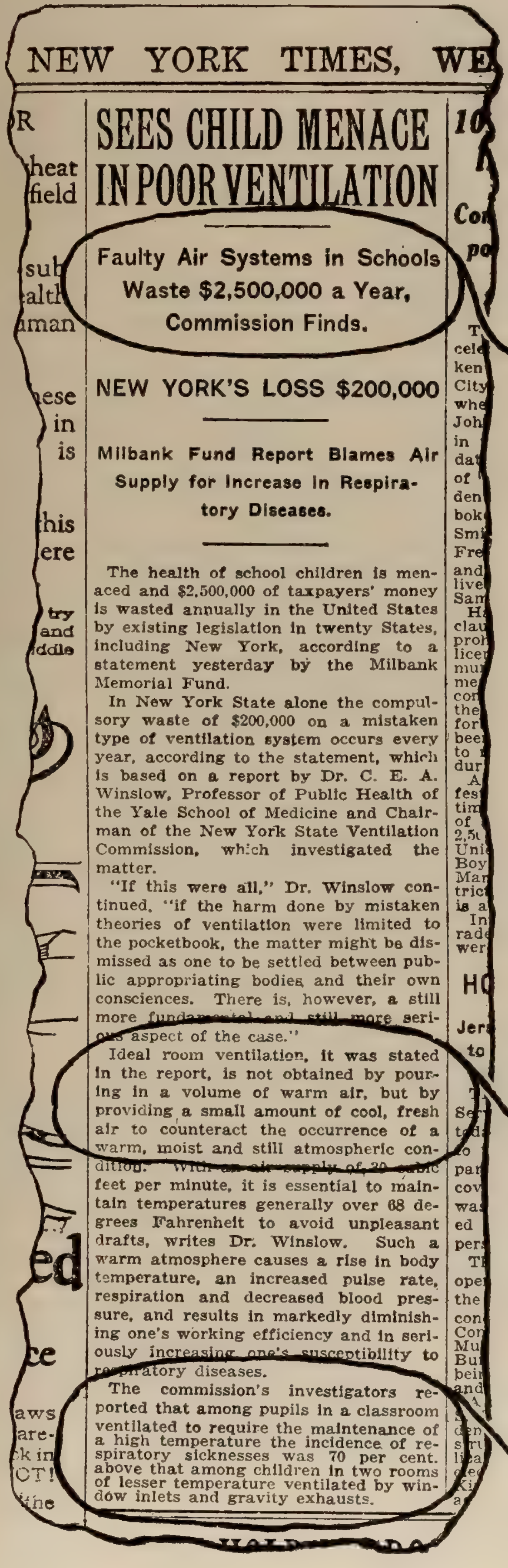
NATIONAL LIME ASSOCIATION, WASHINGTON, D. C.

Two booklets that the architect will want for his file are:

"Lime Stucco."

"Standard Specifications for Lime Plaster."

The first section of "Standard Specifications" contains complete specifications for the preparation and use of lime plaster on all types of backings. These specifications are in such form that they may be copied directly or used as a basis for any architect's complete plaster work specifications.



NEW YORK TIMES, WE

SEES CHILD MENACE IN POOR VENTILATION

Faulty Air Systems in Schools Waste $2,500,000 a Year, Commission Finds.

NEW YORK'S LOSS $200,000

Milbank Fund Report Blames Air Supply for Increase in Respiratory Diseases.

The health of school children is menaced and $2,500,000 of taxpayers' money is wasted annually in the United States by existing legislation in twenty States, including New York, according to a statement yesterday by the Milbank Memorial Fund.

In New York State alone the compulsory waste of $200,000 on a mistaken type of ventilation system occurs every year, according to the statement, which is based on a report by Dr. C. E. A. Winslow, Professor of Public Health of the Yale School of Medicine and Chairman of the New York State Ventilation Commission, which investigated the matter.

"If this were all," Dr. Winslow continued, "if the harm done by mistaken theories of ventilation were limited to the pocketbook, the matter might be dismissed as one to be settled between public appropriating bodies and their own consciences. There is, however, a still more fundamental and still more serious aspect of the case."

Ideal room ventilation, it was stated in the report, is not obtained by pouring in a volume of warm air, but by providing a small amount of cool, fresh air to counteract the occurrence of a warm, moist and still atmospheric condition. With an air supply of 30 cubic feet per minute, it is essential to maintain temperatures generally over 68 degrees Fahrenheit to avoid unpleasant drafts, writes Dr. Winslow. Such a warm atmosphere causes a rise in body temperature, an increased pulse rate, respiration and decreased blood pressure, and results in markedly diminishing one's working efficiency and in seriously increasing one's susceptibility to respiratory diseases.

The commission's investigators reported that among pupils in a classroom ventilated to require the maintenance of a high temperature the incidence of respiratory sicknesses was 70 per cent. above that among children in two rooms of lesser temperature ventilated by window inlets and gravity exhausts.

Read this Article from *The New York Times*

GOOD VENTILATION IS WITHIN THE REACH OF ALL

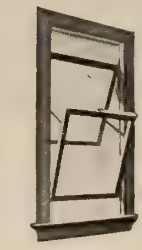
If proper window ventilation in *one* classroom reduced sickness among pupils 70%, the same result can be accomplished in every school in the land—as the AUSTRAL WINDOW is within the reach of all.

Two and a half million wasted in faulty air systems! If all these schools were equipped with AUSTRAL WINDOWS this waste would be eliminated entirely. AUSTRAL WINDOWS add nothing to the cost of your building, but add a permanent source of health and comfort to those occupying the classrooms.

AUSTRAL WINDOWS admit a steady supply of cool fresh air without draft.

Sickness 70% less in window ventilated rooms! AUSTRAL is the solution to this problem.

Write for our NEW SCHOOL CATALOGUE, *giving real, valuable, serviceable data for everyone in the architects' offices, replete with drawings and specifications.*



AUSTRAL
WINDOW
COMPANY

101 Park Avenue New York

MORLAND *Courts, Shaker Heights, Cleveland, Ohio. Alfred W. Harris, Architect, Cleveland, Ohio; W. P. Nelson Co., Painting Contractors—Cleveland, New York, Chicago. Painted throughout with S-W Flat Tone.*

What Architects See

You have an architect's eyes and see in a building what the layman usually misses. You see the skill and painstaking care of the architect which underlies the whole work.

Look upon the Architects' Painting Guide with the same eyes and you will see, not merely four columns of products, but the skill that has produced those products for specific purposes.

The aim of the "Guide" is to relieve architects of all uncertainty in selecting correct paint products for various surfaces. We commend the "Guide" to your attention.

For details of specifications see: The Sherwin-Williams Book of Painting and Varnishing Specifications (sent free upon request) or Sweet's Architectural Catalogue.

We invite correspondence—write to the Department of Architectural Service.

The Sherwin-Williams Co.
406 Canal Road
Cleveland

ARCHITECTS' PAINTING GUIDE

FOR PAINTING • VARNISHING • STAINING AND ENAMELING

IMPORTANT: Each of the products specified below bears our name and trade mark

SURFACE	TO PAINT *Use product named below*	TO ENAMEL *Use product named below*	TO STAIN *Use product named below*	TO VARNISH *Use product named below*
BRICK WALLS (ext).....	*S-W Concrete Wall Finish*	*Old Dutch Enamel,* Gloss		
CONCRETE WALLS....	*S-W Concrete Wall Finish*	*Old Dutch Enamel,* Gloss		
CEMENT FLOORS......	*S-W Concrete Floor Paint*	*S-W Concrete Floor Paint*		
EXTERIOR WOOD SURFACES..........	*SWP* (Sherwin-Williams Prepared Paint)	*Old Dutch Enamel,* Gloss	*S-W Preservative Shingle Stain* *S-W Acid or Oil Stain*	*Rexpar Varnish*
EXTERIOR METAL SURFACES.........	*Kromik Structural Steel Primer* *Metalastic* (for finishing coats)	*Old Dutch Enamel,* Gloss		
FACTORY WALLS (Interior).............	*S-W Eg-Shel Mill White* *S-W Fume Resisting White*	*Old Dutch Enamel or Enameloid*		
FLOORS (Interior Wood)..	*S-W Inside Floor Paint* (the enamel-like finish)	*S-W Inside Floor Paint* (the enamel-like finish)	*Oil Stain or Floorlac Varnish Stain*	*Mar-Not Floor Varnish*
GALVANIZED IRON SURFACES..........	*S-W Galvanized Iron Primer* (Finish with any Paint)	*S-W Galvanized Iron Primer and Old Dutch Enamel*		
INTERIOR WALLS AND CEILINGS...........	*Flat-Tone Wall Finish* *S-W Eg-Shel Mill White*	*Old Dutch Enamel or Enameloid*		
INTERIOR WOOD TRIM...............	*SWP* (Sherwin-Williams Prepared Paint)	*Old Dutch Enamel or Enameloid*	*S-W Acid Stain* *S-W Handcraft Stain* *S-W Oil Stain*	*Scar-Not Varnish* *Velvet Finish Varnish* (for imitation rubbed effect)
PORCH FLOORS AND DECKS............	*S-W Porch and Deck Paint*			
RADIATORS AND PIPES..............	*Flat-Tone Finish or S-W Gold Paint* *S-W Aluminum Paint*	*For White—S-W Snow White Enamel* *For colors—Enameloid*		
ROOFS—Metal.........	*SWP or Metalastic* (if Galvanized, prime with S-W Galvanized Iron Primer)			
ROOFS—Wood Shingle...	*SWP*		*S-W Preservative Shingle Stain*	
STACKS AND HOT SURFACES.........	*Salamander Smoke-Stack Black*			
STRUCTURAL STEEL..	*Kromik Structural Steel Primer* *Metalastic* (for finishing coats)			
TO DAMP-PROOF FOUNDATIONS....	*S-W Antydamp*			
TO DAMP-PROOF INTERIOR WALLS ABOVE GRADE....	*S-W Plaster Bond*			
WOOD PRESERVATIVE			*S-W Carbolic-ol*	*Copyright, 1923, by The Sherwin-Williams Co.*

SHERWIN-WILLIAMS
PAINTS AND VARNISHES
COVER THE EARTH

Residence of David A. Lawrence

Just a glimpse of this beautiful home gives the impression of Southern California or the border of Mexico rather than Washington, D. C.

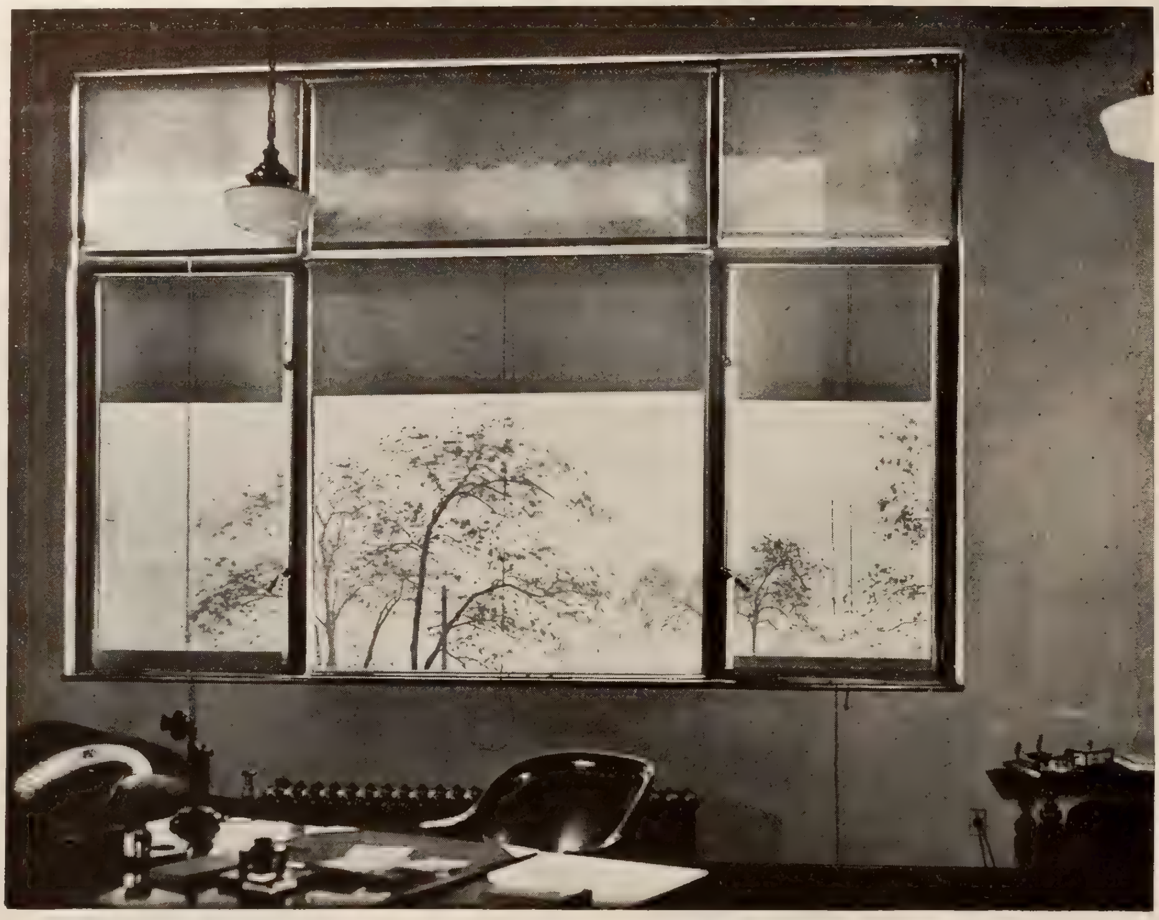
It goes without saying that Arthur B. Heaton, the architect, chose Aero Radiators because they exactly suited the interior scheme of beautiful, airy, bright, comfortably warmed rooms of the Spanish style home.

Your request for literature will receive prompt attention.

NATIONAL RADIATOR COMPANY
JOHNSTOWN, PA.
PLANTS: Johnstown, Pa., New Castle, Pa., Trenton, N. J.
BRANCH OFFICES: New York, Philadelphia, Baltimore, Washington, Richmond, Pittsburgh, Cincinnati, Cleveland and Chicago.

BEAUTY *and* WARMTH *with*
AERO RADIATORS

NRCo



American Furniture Mart, Chicago. Henry Raeder, Architect. Wells Brothers Construction Co., Contractors

Casements of Copper-Steel

LUPTON Casements of copper-steel give an air to the offices of the American Furniture Mart. They overlook Lake Shore Drive and Lake Michigan and secure to the occupants of the building easy access to inspiring scenery and protection against the stiff lake breezes.

Lupton Casements are in every way worthy of this great building, the center of the nation's fine furniture industry.

Architectural beauty, combined with expert workmanship and a rich store of engineering experience, make these Lupton Steel Casements the highest type of window manufacture.

Let us send you a copy of Catalog 12-F.

ALLEGHENY AND TRENTON AVES.
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LUPTON STEEL PRODUCTS
~everywhere

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STEEL WINDOWS EVERYWHERE

Is a cent and a half a day too much?

A BEAUTY of texture and richness of coloring, rivalled by only the finest Oriental rugs—a thickness of yarn and double depth of pile you delight to tread—and an ability to serve a quarter of a century or more—isn't all this worth a cent and a half a day?

The cost of the unusual beauty, heavy pile and longer wear of a "Hartford-Saxony" rug is seldom more.

If you could watch, as we have, the thousands of "Hartford-Saxony" rugs that have braved for years the terrible traffic in hotel lobbies and corridors, you would understand why they are able to endure more years of hard wear than any home ever gives a rug.

"Hartford-Saxony" rugs are made in ninety patterns and twenty-eight stock sizes, and special sizes can be made to order. If you have any difficulty in procuring just the patterns and sizes you want, our New York office will be glad to send you a set of pattern illustrations and a new booklet on "Hartford-Saxony" rugs, beautifully illustrated in colors. The full line is also displayed in all our showrooms, at any of which you are always welcome.

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ESTABLISHED 1825

NEW YORK OFFICE: 385 Madison Avenue
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REGISTERED U. S. PATENT OFFICE

LOOK FOR THE FULL NAME WOVEN IN THE BACK AS A GUARANTEE OF QUALITY

The "Hartford-Saxony" rug illustrated below is Pattern 1695, Color 41.

SUBSTANCE · FORM · AND · COLO

Exterior finish of 27 major buildings by John J. Earley, architectural sculptor

Concrete, made with Atlas, beautified this university

THE State of Louisiana has built, at Baton Rouge, a complete university which is an architectural gem. So far as known, this is the first entire university built in one operation. The group, 27 major buildings, would have been economically impossible for the State in any other material than concrete. Concrete solved the problem, for it is economical, permanent, beautiful and adaptable to any form of construction.

The style, Northern Italian Renaissance, was chosen by the architect, the late Theodore C. Link, as most suitable for the aims and ambitions of the university. Originally this type of architecture utilized field stone built into masonry—in ancient times an economical type of construction because it largely permitted the use of ordinary labor.

Concrete, the modern masonry, furnished modern economy of both material and labor. And just as the old time buildings of that type used stucco to give them symmetry and beauty, this modern group used today's stucco, made with Atlas Portland Cement, with even greater possibilities for both beauty and permanence.

The same qualities that made Atlas the preferred material for this achievement in modern building—the same combination of economy, beauty and permanence—also make Atlas the logical material for any other structure of merit, whether it be the home, the industrial building or the elaborate public structure. It is one more indication of the reason Atlas is known as "the Standard by which all other makes are measured."

Between the Atlas plants and the user there is but one distributor—the building material dealer—who brings Atlas to the public cheaper than by any other method. Any architect, contractor or prospective builder is invited to write this Company regarding the possibilities of concrete, made with Atlas.

Atlas Portland Cement

The ATLAS PORTLAND CEMENT Company
25 BROADWAY, NEW YORK, N. Y.
CHICAGO PHILADELPHIA BOSTON BUFFALO BIRMINGHAM ST. LOUIS KANSAS CITY INDEPENDENCE, KANS. DES MOINES DAYTON JACKSONVILLE, FLA. OMAHA

Atlas White Portland Ceme

"Thanks to our architect, we have a wonderful lavatory," says Mrs. Woodward

THAT the architect will provide an artistic, pleasing and practical design for the home is largely taken for granted. That is, of course, what he is engaged for.

But when he proffers expert guidance in the choice of such things as bathroom equipment he performs a sort of plus service to the householder that is sometimes remembered more vividly than his greater work.

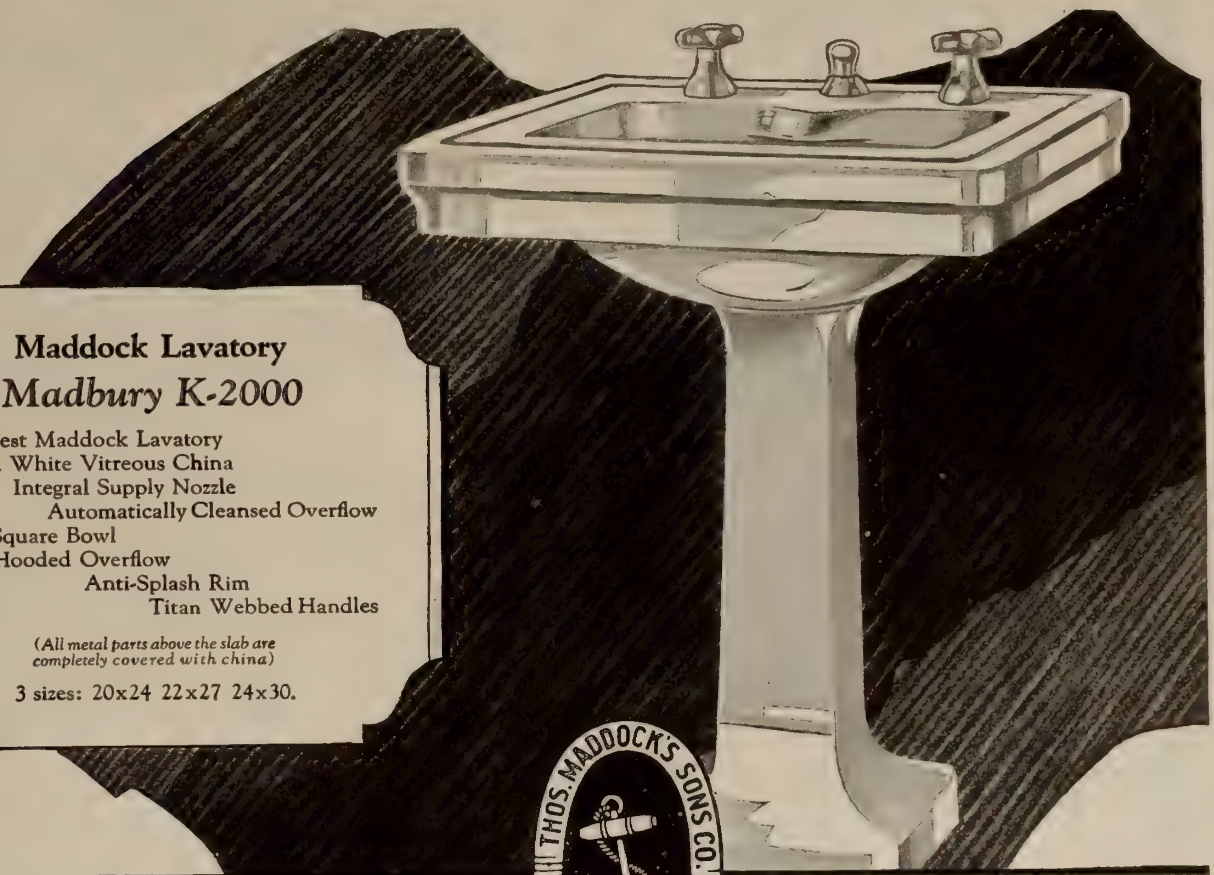
And this is not unnatural, since the lavatory, for instance, becomes a very important factor in the daily life of the family.

This Maddock Madbury Lavatory is sure to reflect credit upon the architect who recommends it, for no one can fail to appreciate its superior convenience, cleanliness, beauty and durability. It is the last word in modern lavatories.

Every metal part above the slab is completely covered with the same vitreous china as that of which the remainder of the lavatory is made. There is no nickel to require polishing.

Maddock vitreous china means a lavatory with a surface that never becomes scratched or roughened — hence never collects a film of soil and soap-curd. It is easily kept clean by merely wiping with a damp cloth. Vitreous china does not chip, crack nor craze.

Write for as many copies as you can use of our new booklet, "Maddock Bathrooms." They will help you to "sell" clients on quality fixtures, and make them more appreciative of such fixtures when recommended. There will be no charge for the booklets.



Maddock Lavatory

Madbury K-2000

The finest Maddock Lavatory
All White Vitreous China
Integral Supply Nozzle
Automatically Cleansed Overflow
Large Square Bowl
Hooded Overflow
Anti-Splash Rim
Titan Webbed Handles

(All metal parts above the slab are completely covered with china)

3 sizes: 20x24 22x27 24x30.

THOMAS MADDOCK'S SONS COMPANY, *Trenton, N.J.*

THOS. MADDOCK'S SONS CO. TRENTON, N.J.

MADDOCK

Bathroom Equipment

The Rochester Packing Co., Rochester, N. Y.

Architects
Henschien & McLaren
1637 Prairie Avenue
Chicago

Contractors
A. Fredericks & Sons Co.
Rochester, New York

Better Doors mean Better Refrigeration

WHEN it became necessary to enlarge this plant in 1923, to take proper care of Rochester's capacious and growing appetite, no pains were spared to make it a shining example of modernity and efficiency.

The present plant has a total of 743,766 cubic feet of refrigerated space. 200 tons of refrigeration can be produced daily. 1,000 hogs per day can be sped on their way to fulfill their destiny as the "Blue Ribbon" brand of Hams, Bacon, Sausage, and other Blue Ribbon porcine delights which are the prime favorites over a wide area in "upstate" New York.

A total of 35 Jamison Installations help maintain peak efficiency in this packing-house. Jamison installations are now found in 17,000 plants, which include ALL the big ones, most of the little ones, and all of those which demand 100% efficiency.

Write for Catalog

It explains why the above door and other Jamison Doors are to be found in the finest packing plants in North America, South America, Europe, and Asia. It gives complete details regarding all Jamison Equipment, together with blue-print details of construction.

Jamison Doors

Jamison Cold Storage Door Company
Hagerstown, Maryland, U. S. A.

VITROLITE

For Apartment Bathrooms and Kitchens

VITROLITE

Better Than Marble

Unrivalled in Beauty and Cleanliness

THE finest of apartments is a failure unless it appeals to a woman's eye; unless it makes a woman want it for a home.

Nothing contributes so much to the rentability of an apartment as the appearance and the usefulness of the bathroom and the kitchen, or kitchenette. Here is where Vitrolite offers the architect the greatest opportunity, with reasonable expense, to provide attractions to hold the eye of the feminine tenant.

No other material can compete for this purpose with this fire-polished, always-clean surfacing material. It is available in gleaming white, in jet black, and in colors. It can be decorated to meet any design. It provides a range of effects from the most simple to the most elaborate.

Vitrolite is the extremely practical wall, floor and ceiling surfacing. There are no upkeep costs. Once installed it lasts forever. It is nonporous. It will not stain. It will not discolor. It will not absorb odors or grease. Its smooth surface will never craze, even under extremes of temperatures. Every housewife knows how important these features are in the kitchen and in the bathroom.

Vitrolite never requires scouring. It is thoroughly cleaned with a sweep of damp cloth—no wonder every woman wants it in her home.

That every architect may recommend Vitrolite to his clients, all installations are made by factory trained men using a patent elastic cement. Therefore, every installation is absolutely guaranteed.

Write us for detailed information, or inquire of branch nearest you.

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Old Reliable

"2081" in the Specifications

Through the changing styles in electric switches, one stands out with the changeless merit of an "Old Master." This OLD RELIABLE—"2081."

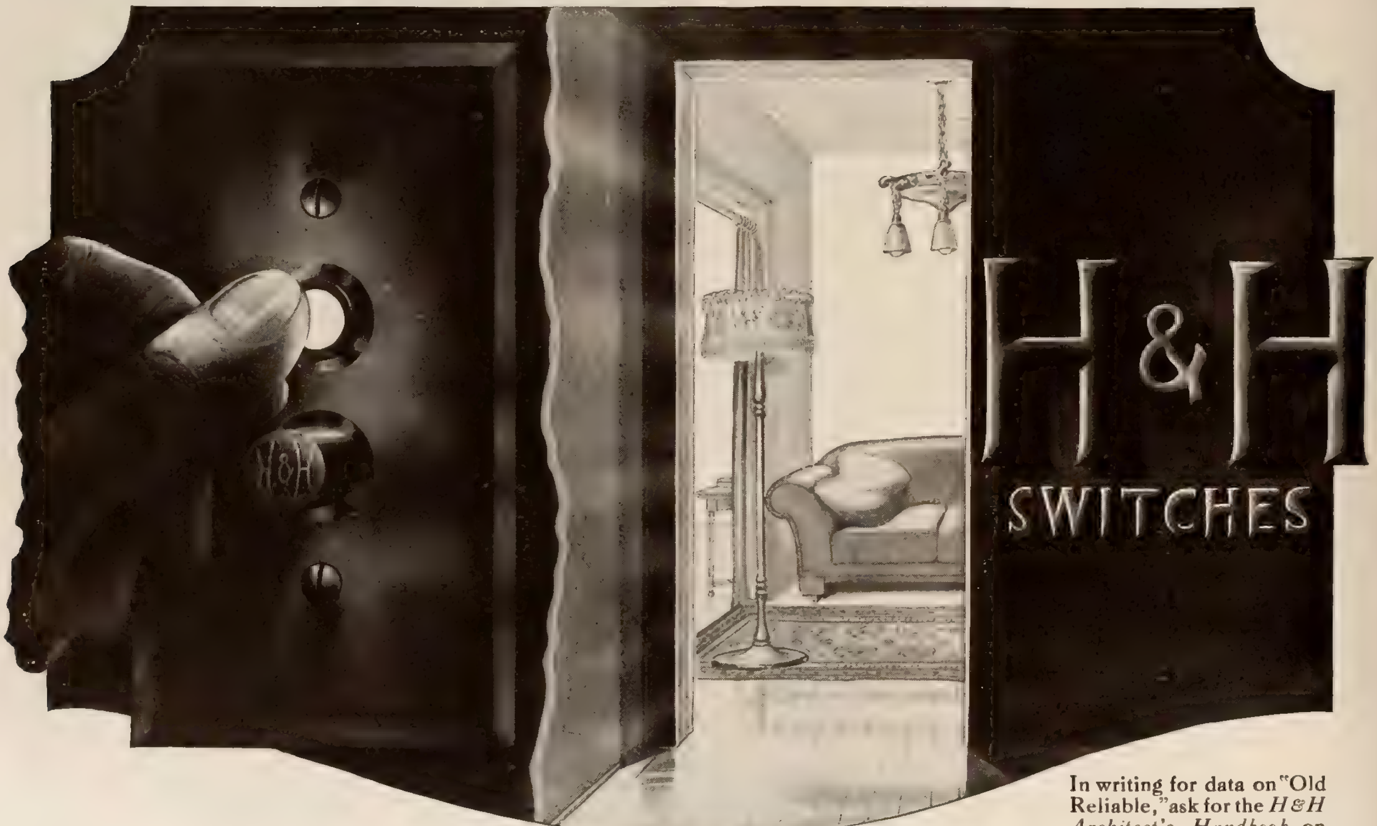
Approved for more than a generation, the architect's favorite from the first, the genius of its design keeps it perennially in the specifications.

Square Handle Tumblers have come into vogue; "balanced movements" by H & H; milestones of switch-making. But none have replaced "Old Reliable" for faithful service.

The buttons press with an even tension; no more resistance near the end of the stroke than at the beginning. No jar as the spring acts and the contacts meet.

In the whole installation, it's the one place your client *feels* Quality. It puts him *in touch* with electrical standards. Impresses a sense of craftsmanship!

Not so high-priced as some switches; not so low as some others. Just a splendid value in-between—and just the switch for many a job that's built to outlast "style."



In writing for data on "Old Reliable," ask for the *H&H Architect's Handbook* on Switches, Convenience Outlets and other devices.

"2081" in your specifications

THE HART & HEGEMAN MFG. CO. HARTFORD, CONN.

HORN-WATER-PROOFINGS

Entire Wrigley Building Repointed with
VULCATEX

All joints between terra cotta were raked and pointed a year ago with Vulcatex Caulking Compound.

So satisfactory were the results that on the recent addition, Vulcatex was used throughout for pointing all projecting and exposed surfaces.

Also used in all expansion joints both horizontally and vertically.

Wrigley Building, Chicago
Graham, Anderson, Probst & White
Architects

Dehydratines

No. 1—Replaces furring, or used in conjunction with it—to damp-proof the interior surface of exposed brick or terra cotta walls—before plastering.

No. 2—A transparent damp-proof coating for the exterior of stone, brick—concrete walls. Preserves the surface and prevents discolorations and efflorescence.

No. 10—Damp-proofs exposed walls, with a heavy troweled coating on the inside face. Replaces furring. The most positive method of damp-proofing.

No. 80—A liquid compound to lubricate, hasten the hardening and permanently strengthen cement, mortar and concrete mixture.

Hydratite

Water-proofs concrete and cement mortar integrally and permanently. Used in mortar joints—stucco—foundations and floors.

A. C. Horn Company

LONG ISLAND CITY, N. Y.
39 Horn Building

DUMB WAITERS
and ELEVATORS

Why Sedgwick Service Pays

4—Durability Reason

Durability is built right into Sedgwick Hand Power Elevators and Dumb Waiters. As a result, they wear, and *wear* and WEAR, giving constant satisfactory service. Many Sedgwick outfits have been in use for twenty years or more. We have never heard of Sedgwick Hand Power Elevators or Dumb Waiters wearing out. That's why Sedgwick outfits are specified almost without exception.

Write for literature and request list of references, if desired.

SEDGWICK
MACHINE
WORKS
140 West 15th Street
New York

Extending Public Interest by Floodlighting

Every notable and beautiful building receives the attention and interest of newspapers and public when first built. To extend for many years this interest, which is of tremendous value to the owners and occupants, use Major Floodlighting.

It is not expensive with these efficient floodlights and the reputation gained for both builder and building is well worth consideration.

Send for estimates and details, without cost or obligation

MAJOR
Major Equipment Company
360 N. Michigan Ave.
Chicago

MAJOR FEATURES

Housing of one piece, spun aluminum enclosing all focusing parts, excepting focusing screw operated from the outside. Special Bausch and Lomb Reflector of high efficiency and molded convex heat-resisting glass front.

Send for beautiful complete bulletin

Artistry plus ILLUMINATION

University Newel, for brick or stone pillars at driveway entrances

WESTINGHOUSE fixtures are the rare combination of art and science in illumination.

Artistry is conspicuous in the beautiful designs.

Take, for example, the University Newel shown here. The original design was a creation by Mr. E. H. Bennett of Chicago. Various adaptations of it were used to beautify Grant Park of that city. A very beautiful bracket is made in this same design.

Artistic though these fixtures are, illuminating efficiency has not been sacrificed.

The proper distribution of light has become an exact science. Westinghouse Illuminating Engineers have spent years in the development of this science and are largely responsible for the vast strides that have been made.

Our Illuminating Engineering Bureau is ready to help you with any illuminating problem.

Westinghouse Electric & Manufacturing Co.
George Cutter Works South Bend, Ind.
Sales Offices in All Principal Cities of
the United States and Foreign Countries

Westinghouse

X 82167

Kernerator-equipped home of Mr. S. P. Crosby, 104 Mississippi River Blvd., St. Paul, Minn. Architect, Peter Linhoff, St. Paul.

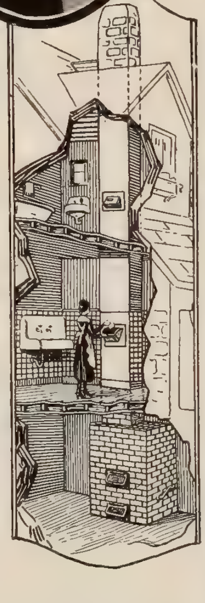
Instant Waste Disposal

—time tried and proved

In such excellent homes as this one which Architect Linhoff has created for S. P. Crosby of St. Paul, the Kernerator is the accepted means of garbage and waste disposal. For this great convenience removes for all time the most distasteful task of housework—and the moderate first cost is the *only* expense, since it—

Costs Nothing to Operate No Fuel Required

The waste itself is all the fuel required. As shown, the Kernerator consists of a brick incinerator chamber, built in when building is being erected, with handy hopper door opening into the flue in or near the kitchen. *All* waste—garbage, sweepings, tin cans, bottles, broken china, rubbish of all sorts—when dropped through the hopper door, falls to the combustion chamber. Here an occasional lighting burns everything but metallic objects and the like. These are sterilized by the flame and later removed with the ashes.



The Kernerator must be built in at the base of the regular chimney when building is being erected—it can rarely be installed later.

For full details see Sweet's, pages 2536-37 (1924) or write

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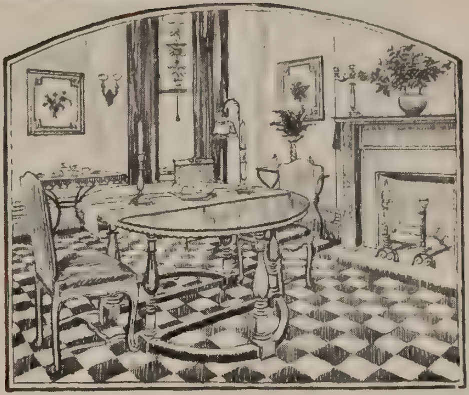
This is one of the beautiful new designs in Armstrong's Marble Inlaid Linoleum, No. 71, with a border of Plain Black, No. 27

And now fashion demands color and pattern in floors

TODAY in old homes as well as new, somber floors of wood are being replaced by these newer, brighter floors of Armstrong's Linoleum.

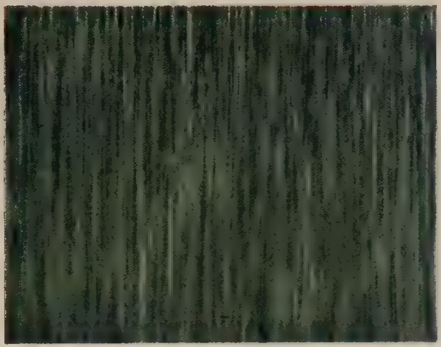
These new floors may serve as a source of inspiration to the architect and decorator. They open up new possibilities for smartly modern decorative schemes not only for the well-planned home, but for shops, libraries, schoolrooms, and public institutions as well—wherever the public walks.

Handcraft Tile No. 3147



This dining-room floor of black and cream linoleum is in the home of Agnes Foster Wright, formerly president of the Interior Decorators' League of New York

Just a few of the new Armstrong designs are shown on this page. There are scores to choose from—brilliant or quiet, formal or gay, whatever keynote of color the spirit of a room demands.



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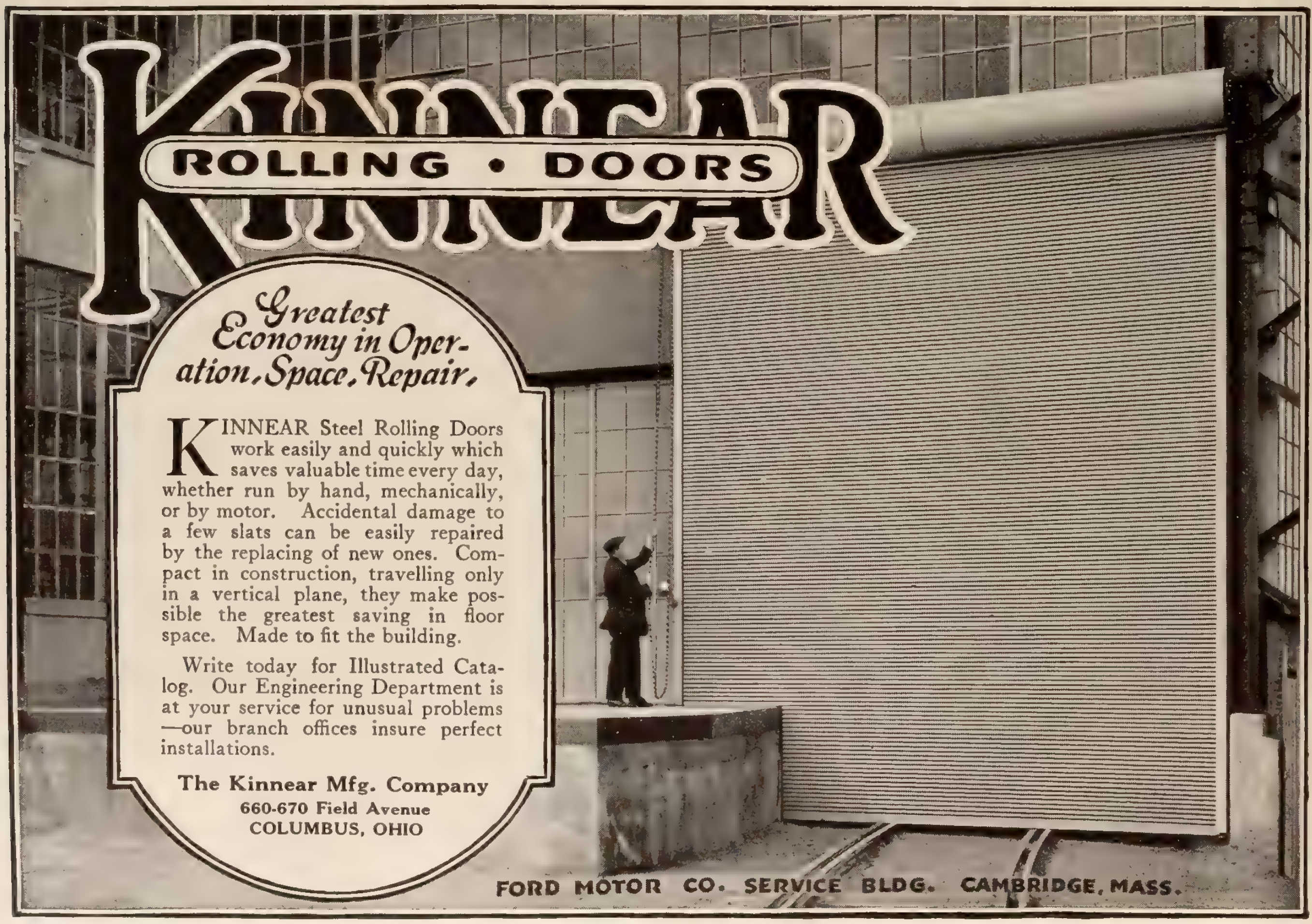

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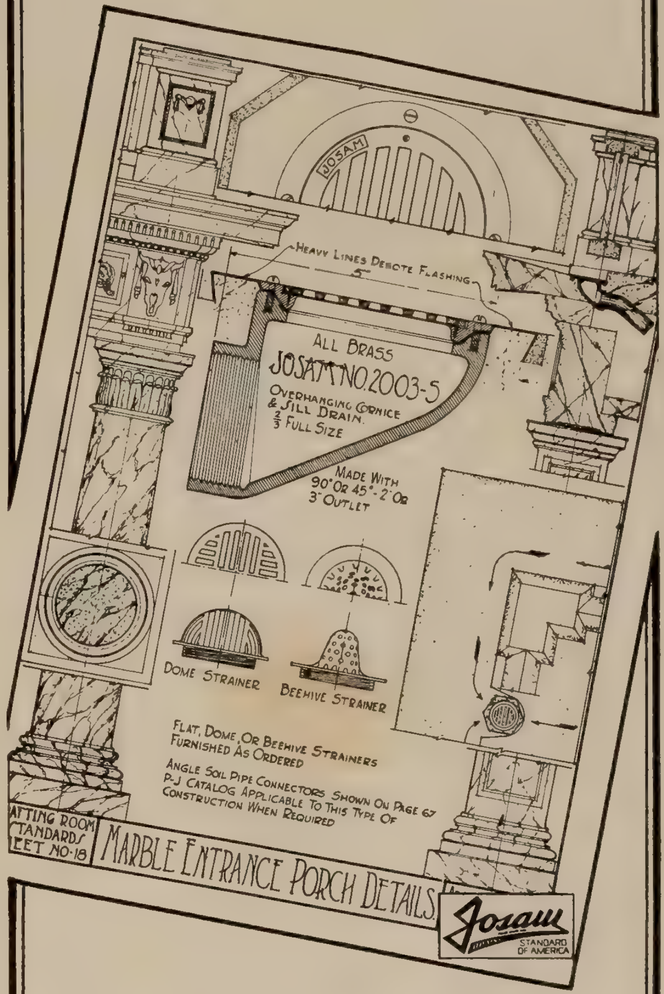
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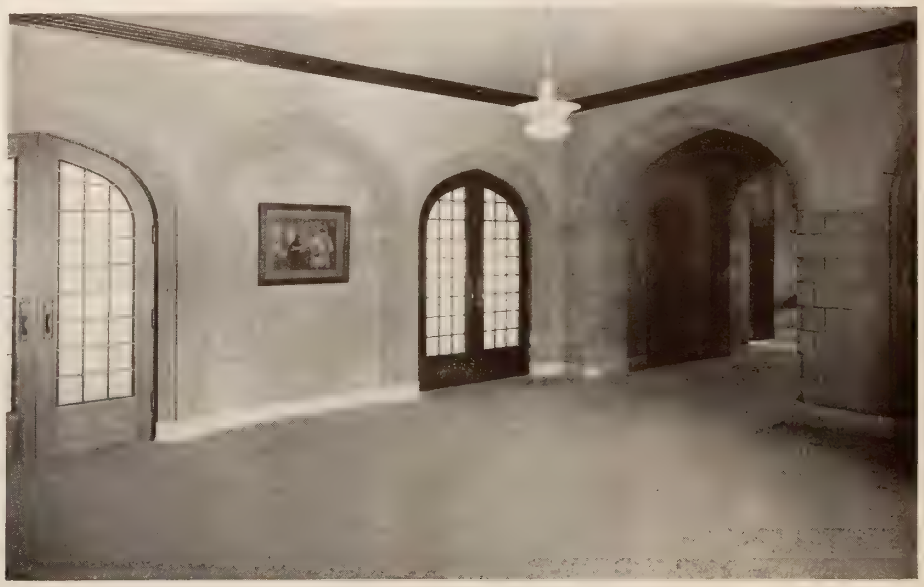

Lobby and Corridors, Administration Building, Evansville College, Evansville, Ind.
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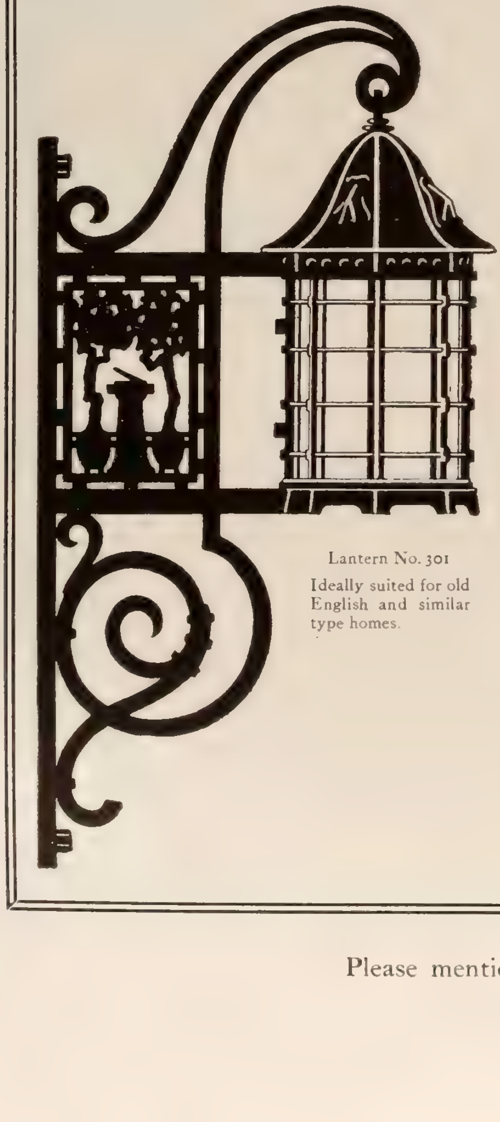

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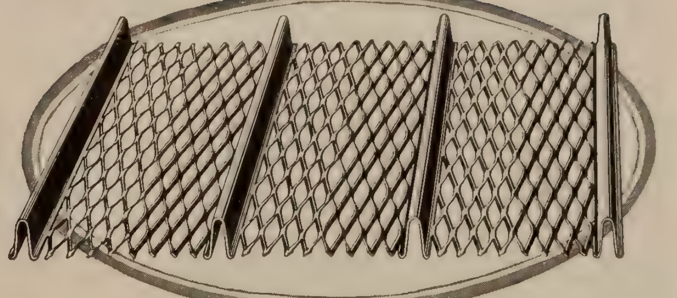

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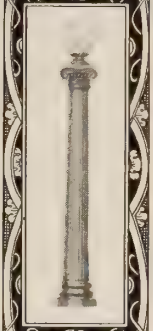

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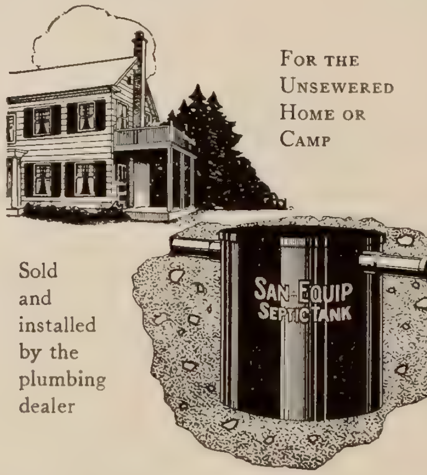

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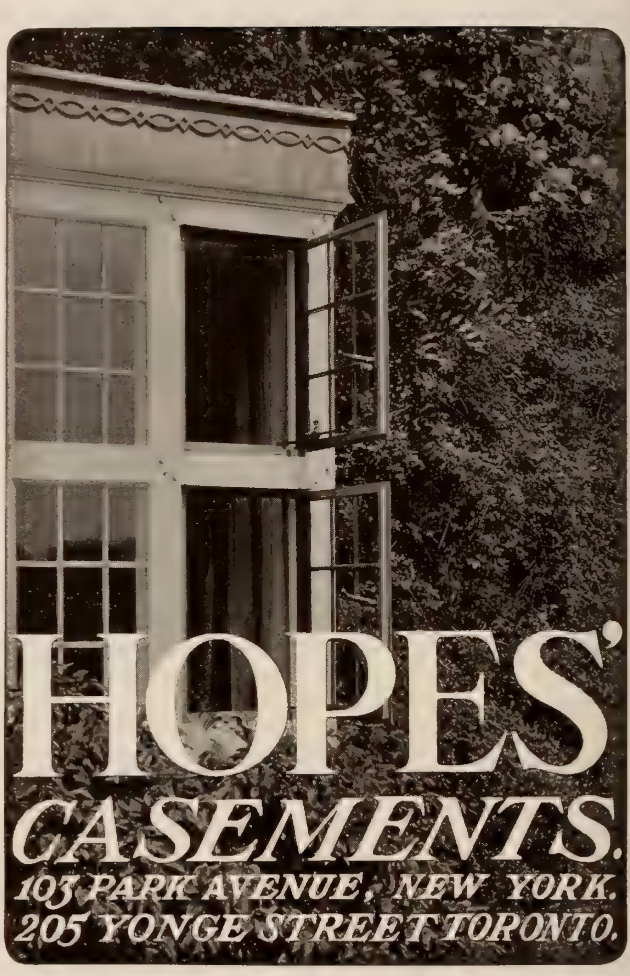

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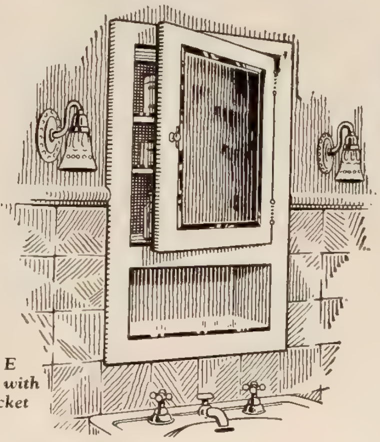

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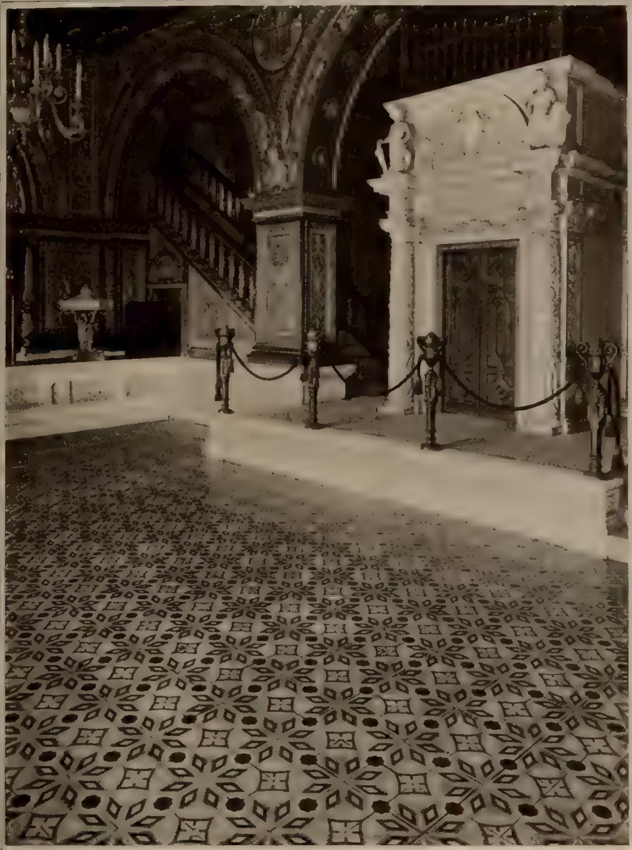

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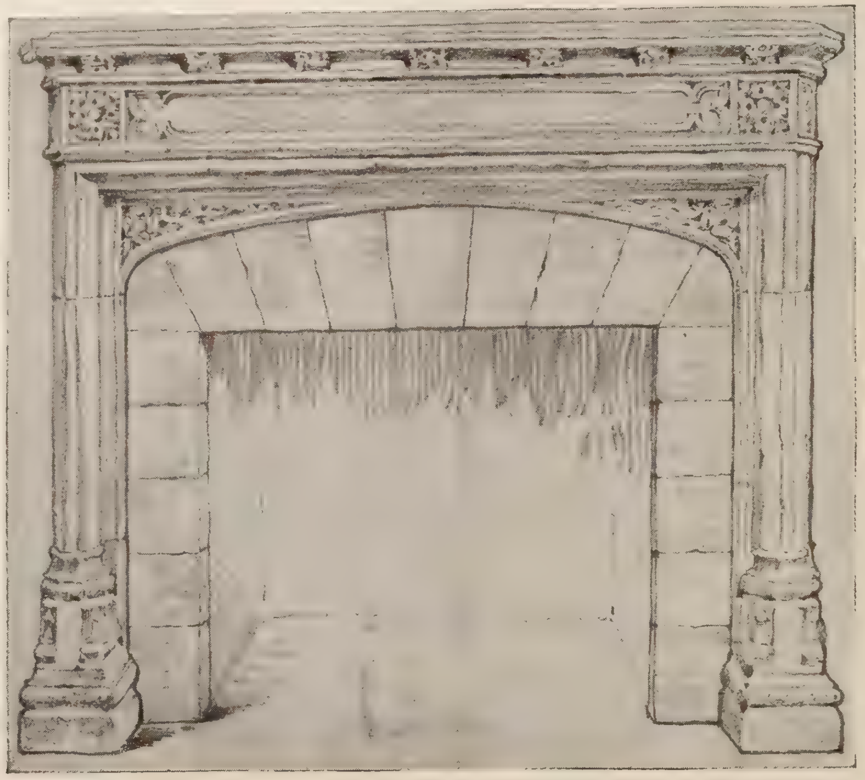

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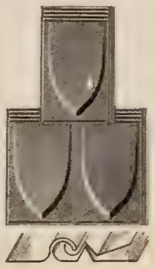

Fig. 157

Note the construction of patent Interlocking Device used on Edwards Metal Shingles and Spanish Tile

Fig. 367

Metal Spanish Tile for main part of roof.

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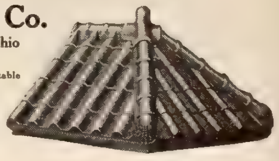

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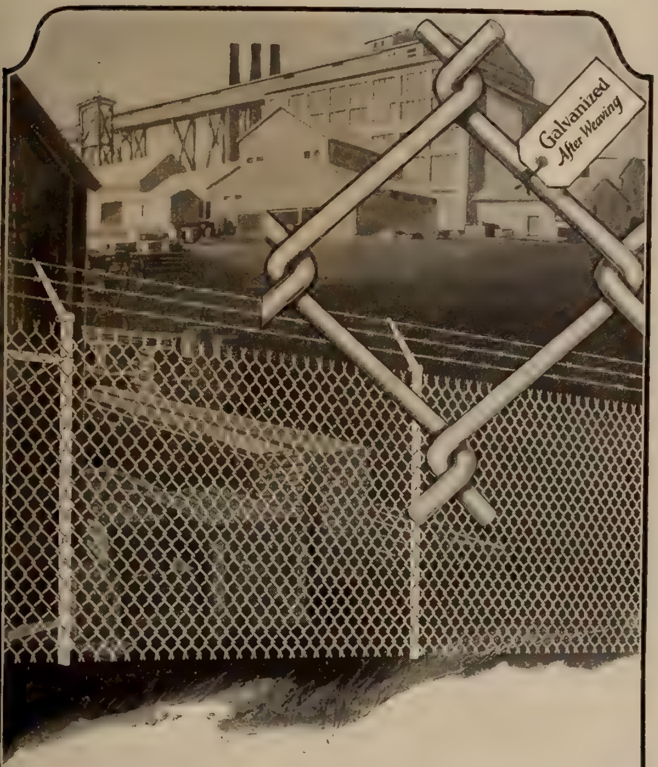

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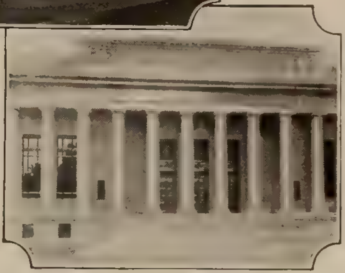

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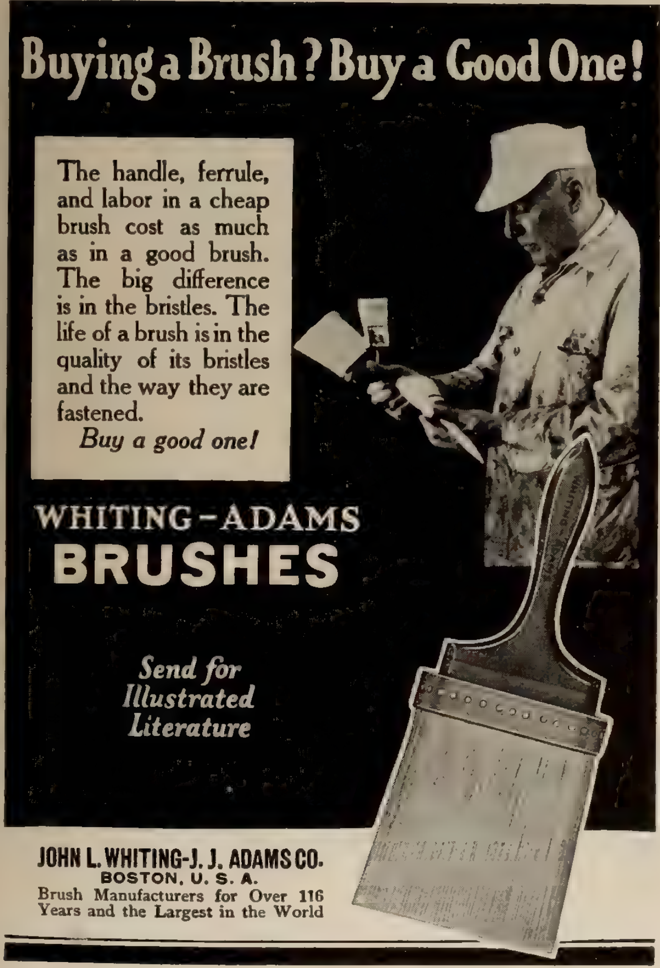

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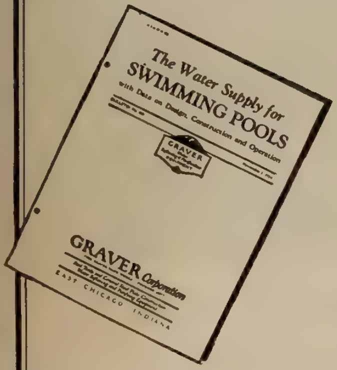

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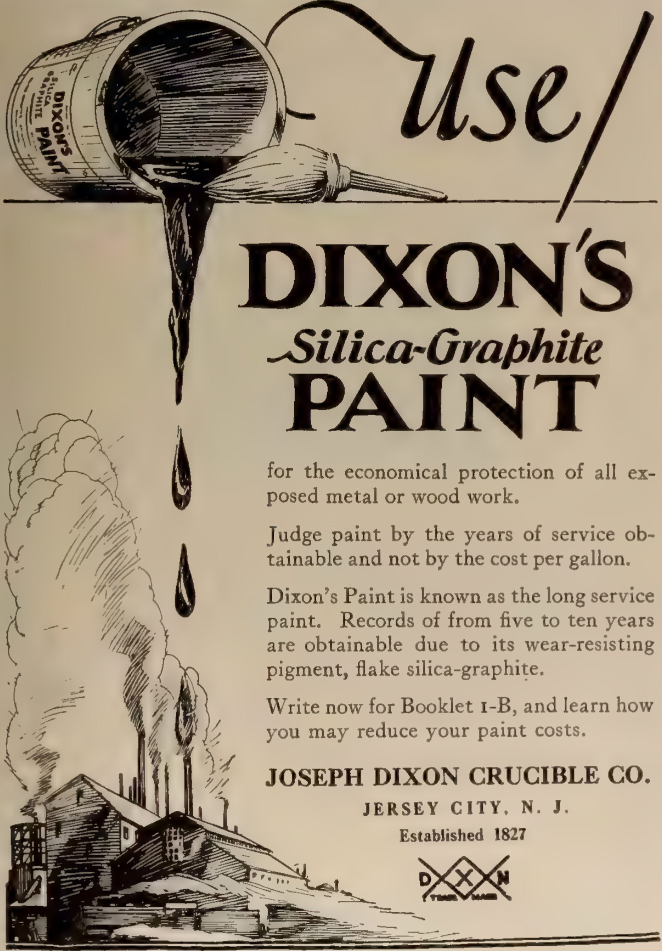

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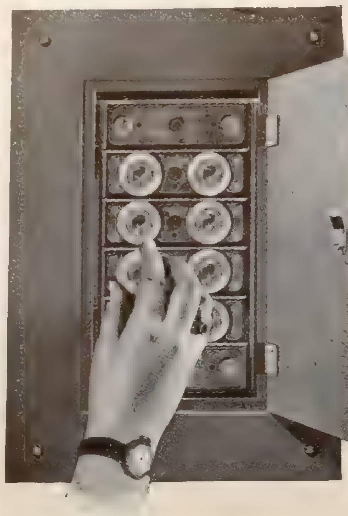

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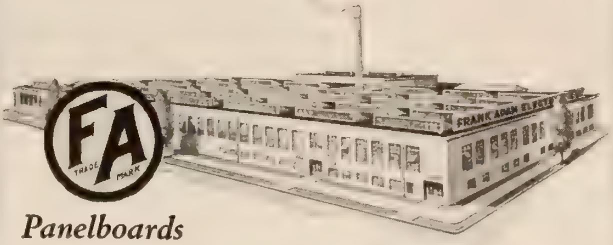

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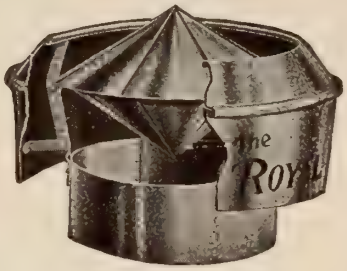

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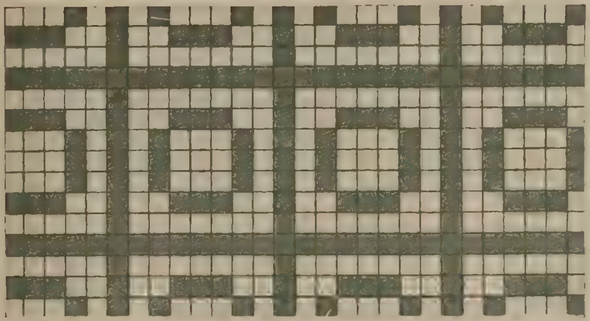

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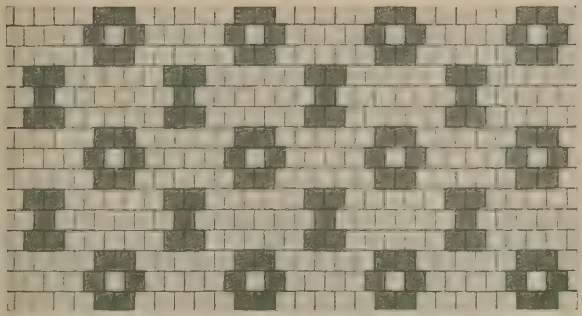

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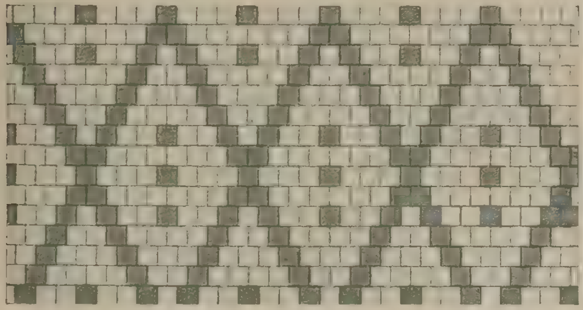

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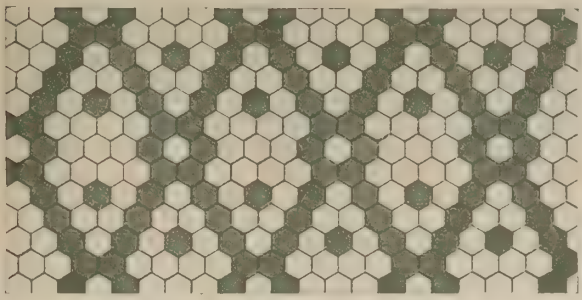

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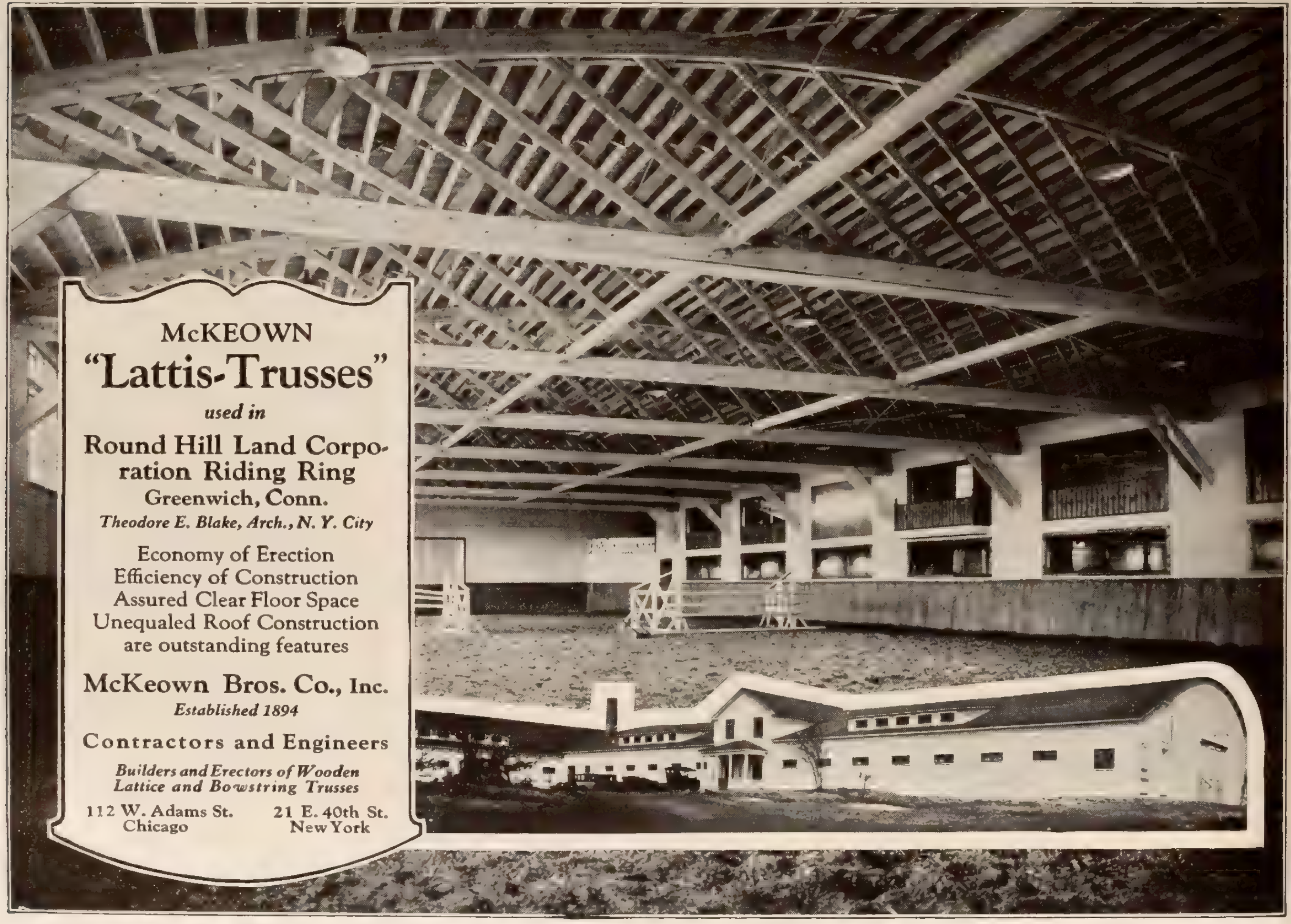

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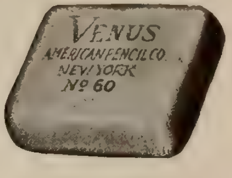

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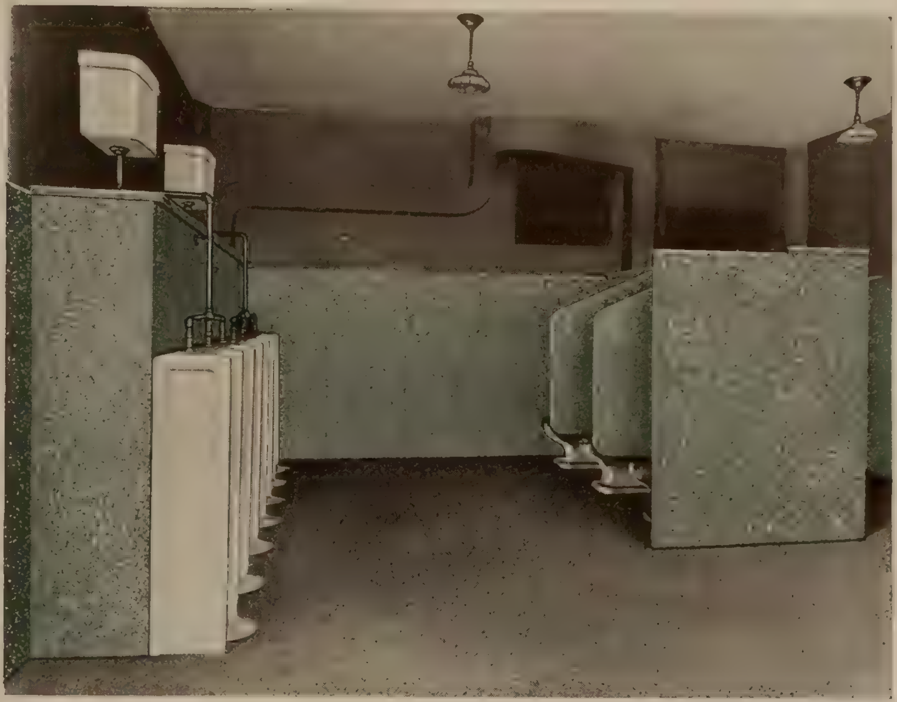

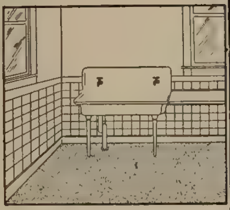

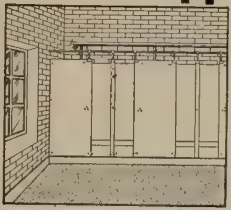

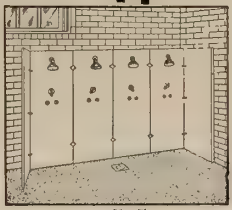

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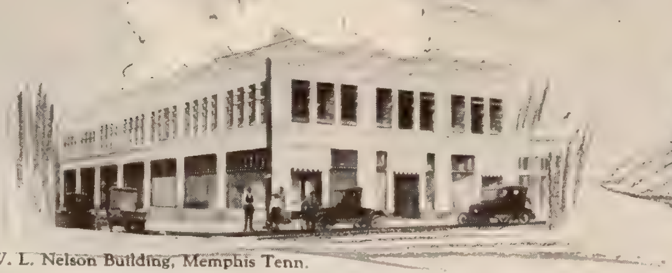

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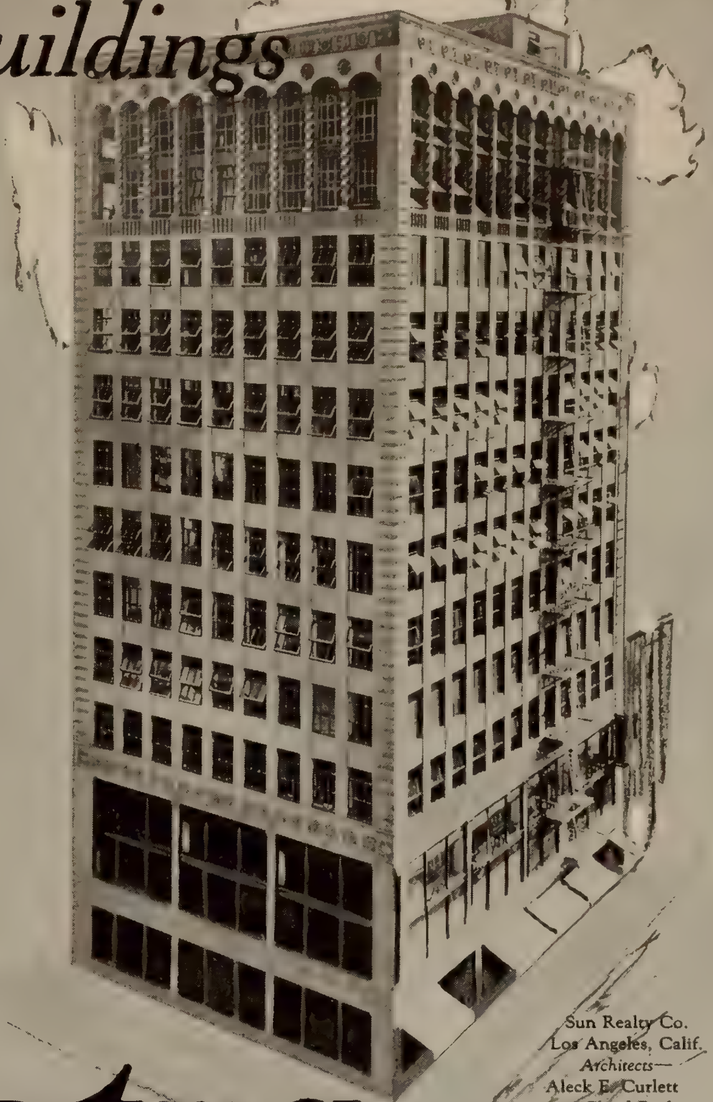

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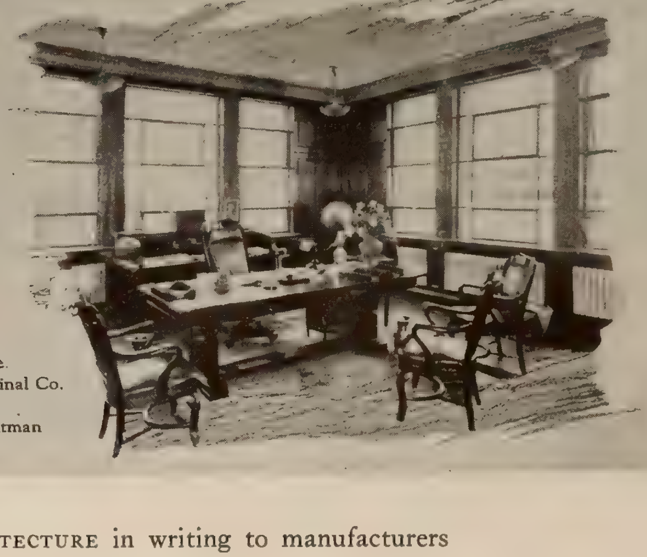

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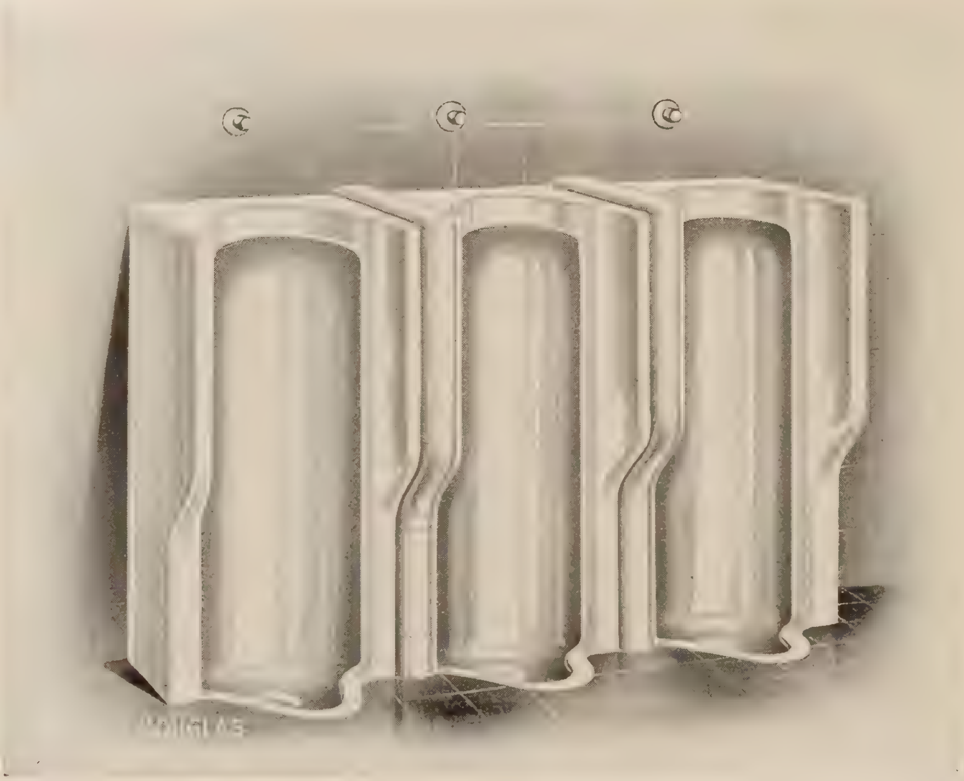

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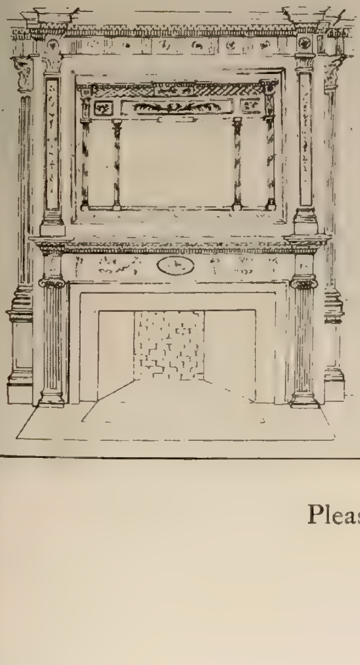

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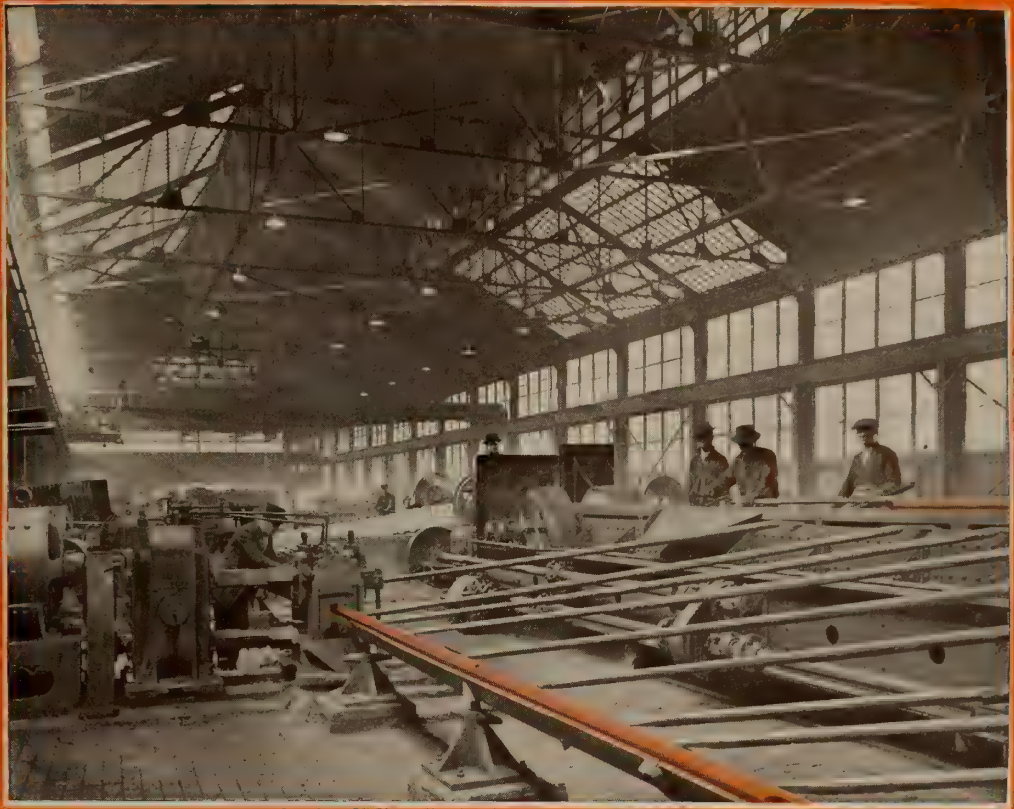

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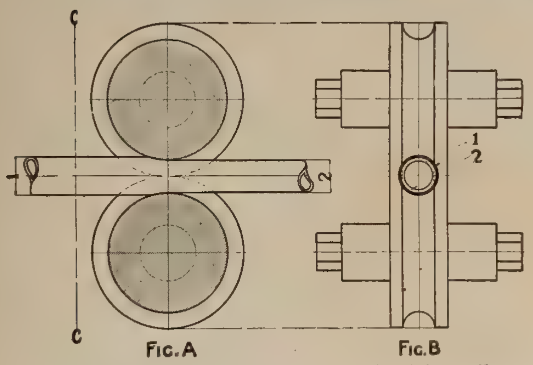

Fig. A shows pipe being reduced in the sizing rolls after being welded. Fig. B is a sectional view taken on the line C–C of Fig. A.
"1" shows the outside diameter before and "2" the outside diameter after the pipe passes through the sizing rolls.

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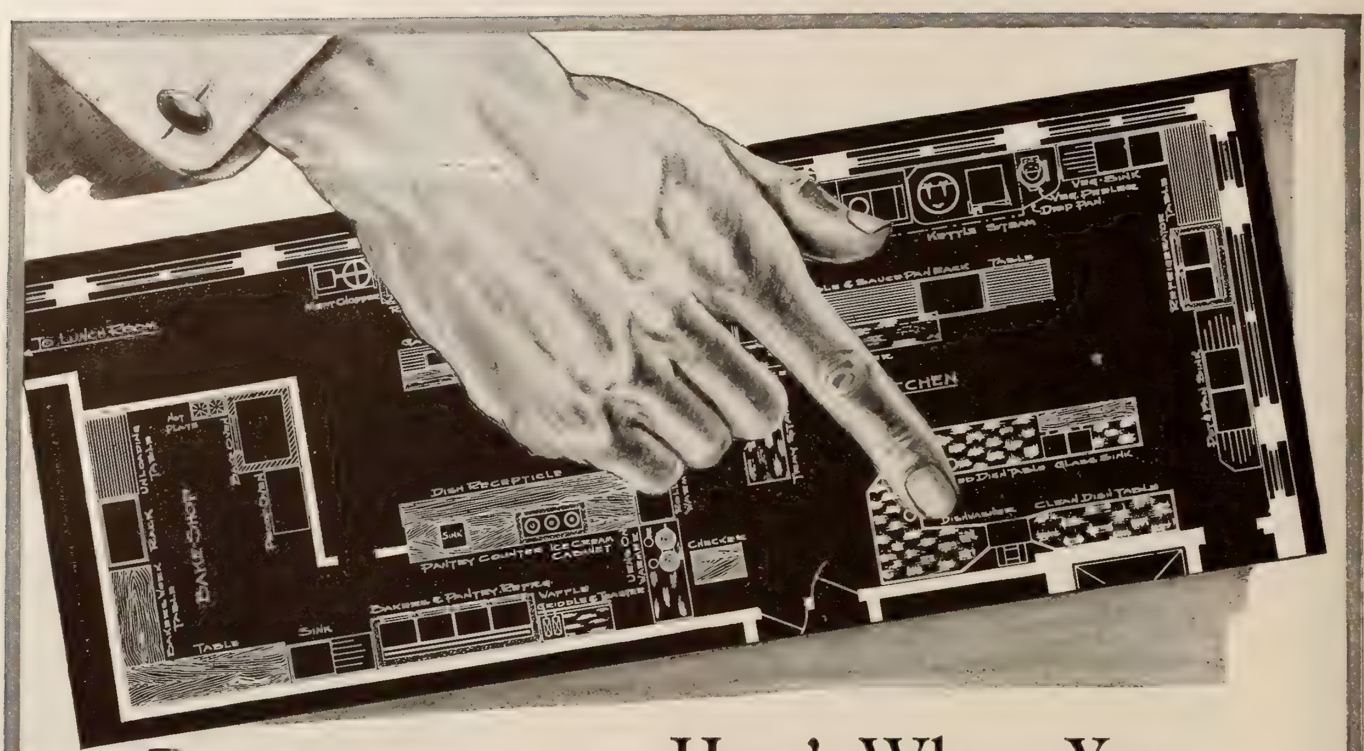

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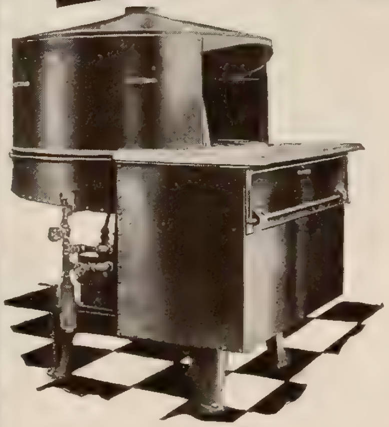

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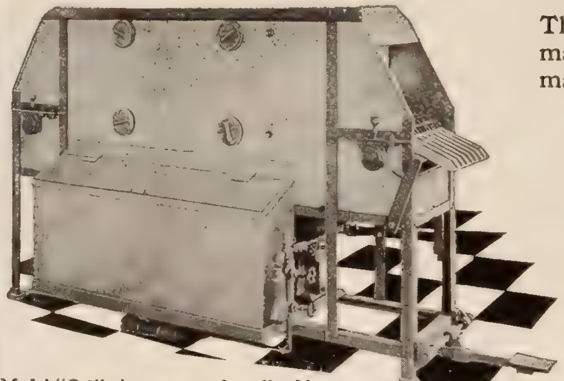

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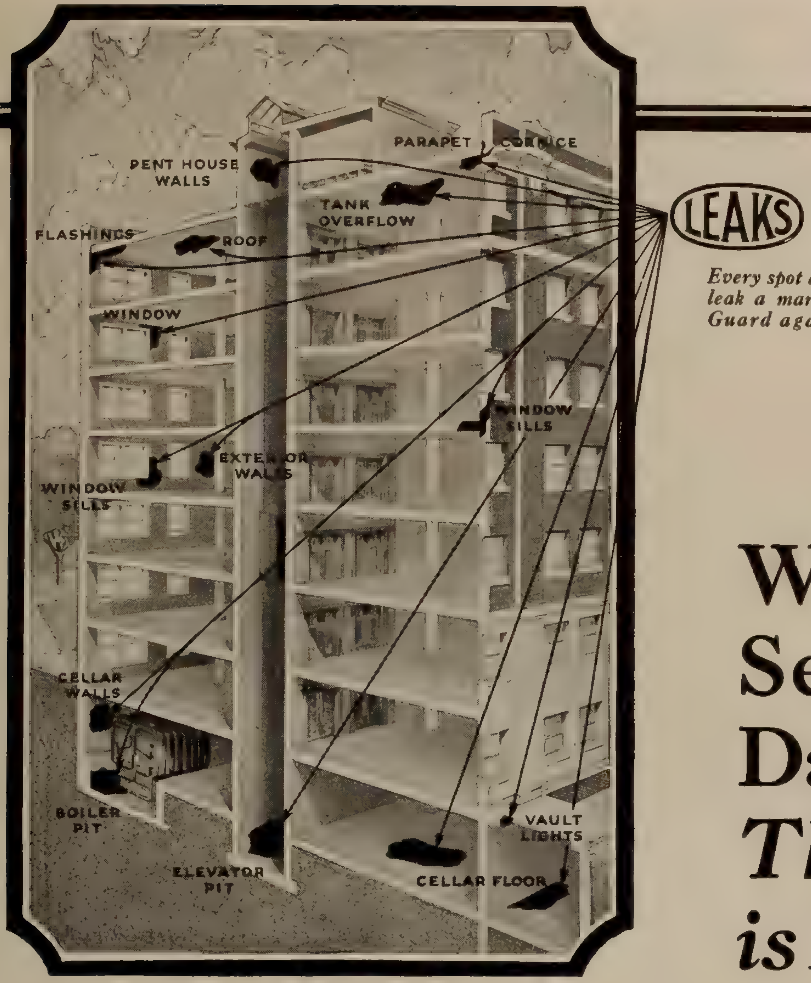

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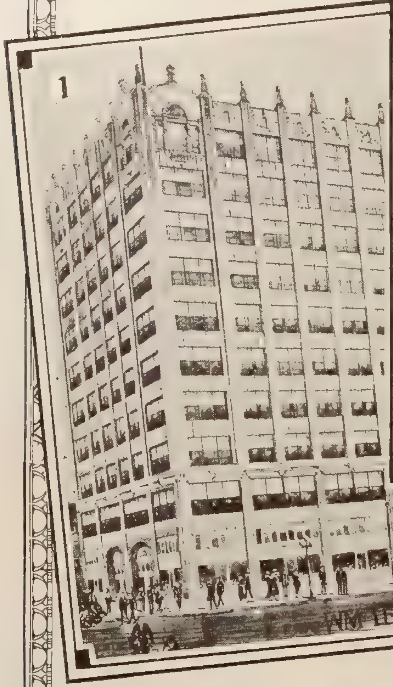

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5 Birmingham Athletic Club; Warren, Knight & Davis, architects; Smallman-Brice, contractors.

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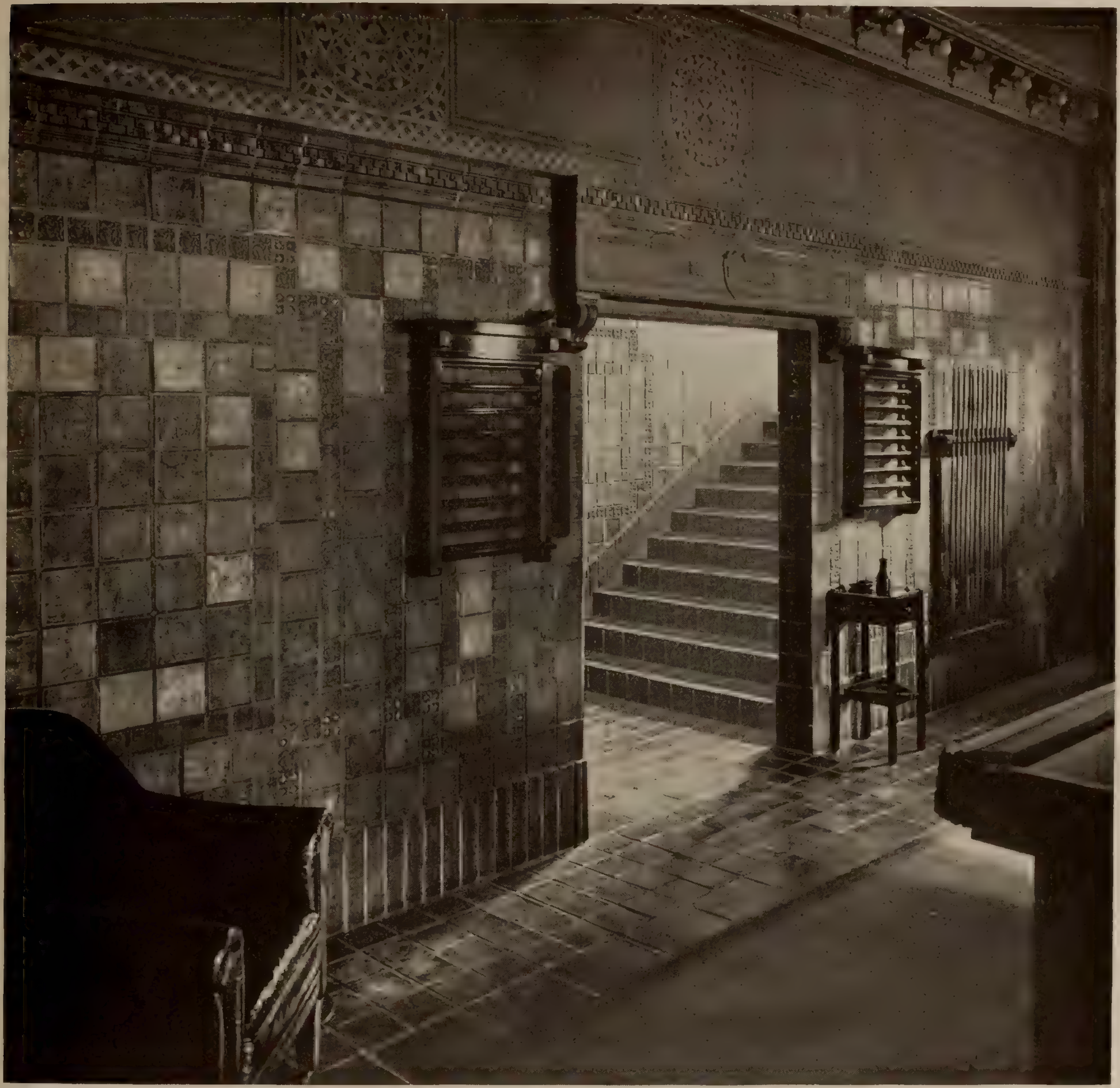

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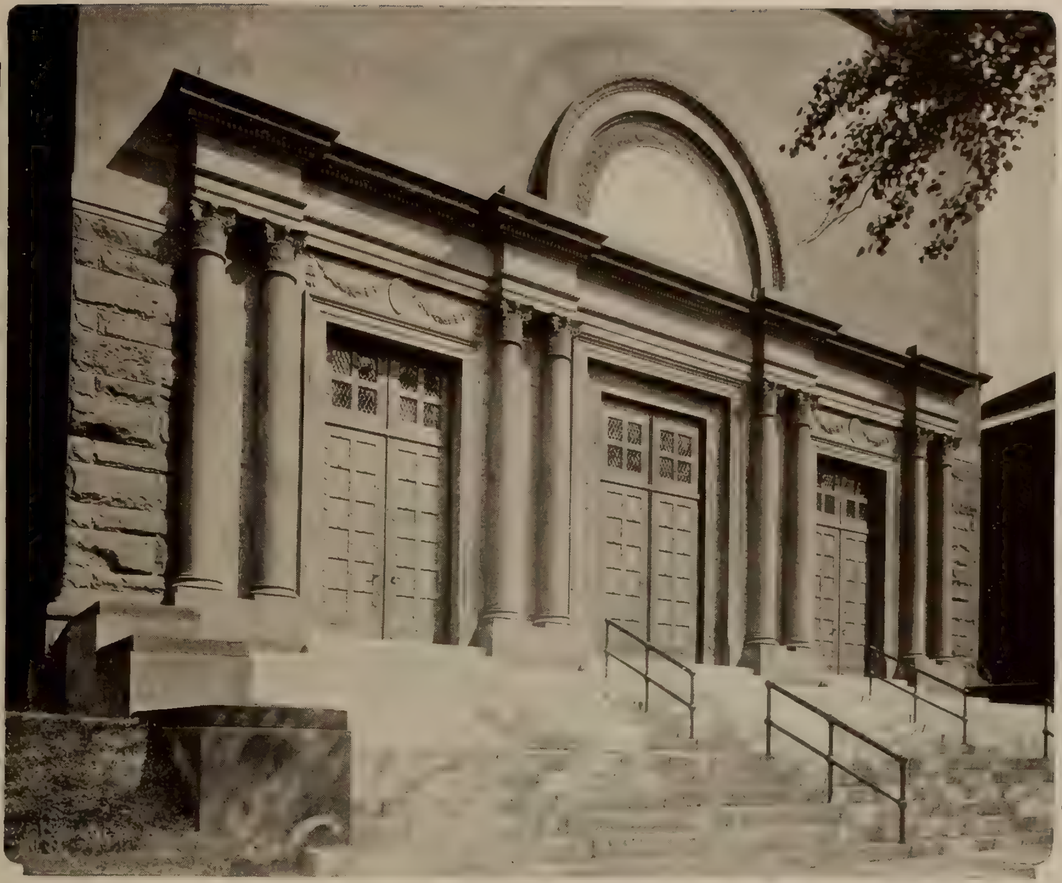

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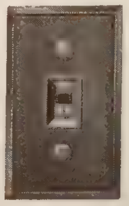

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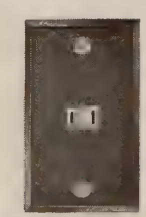

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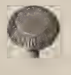

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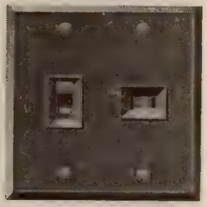

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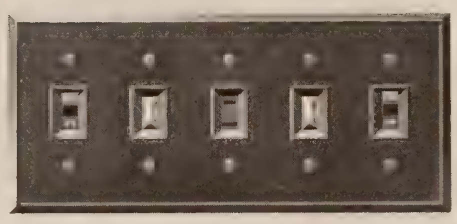

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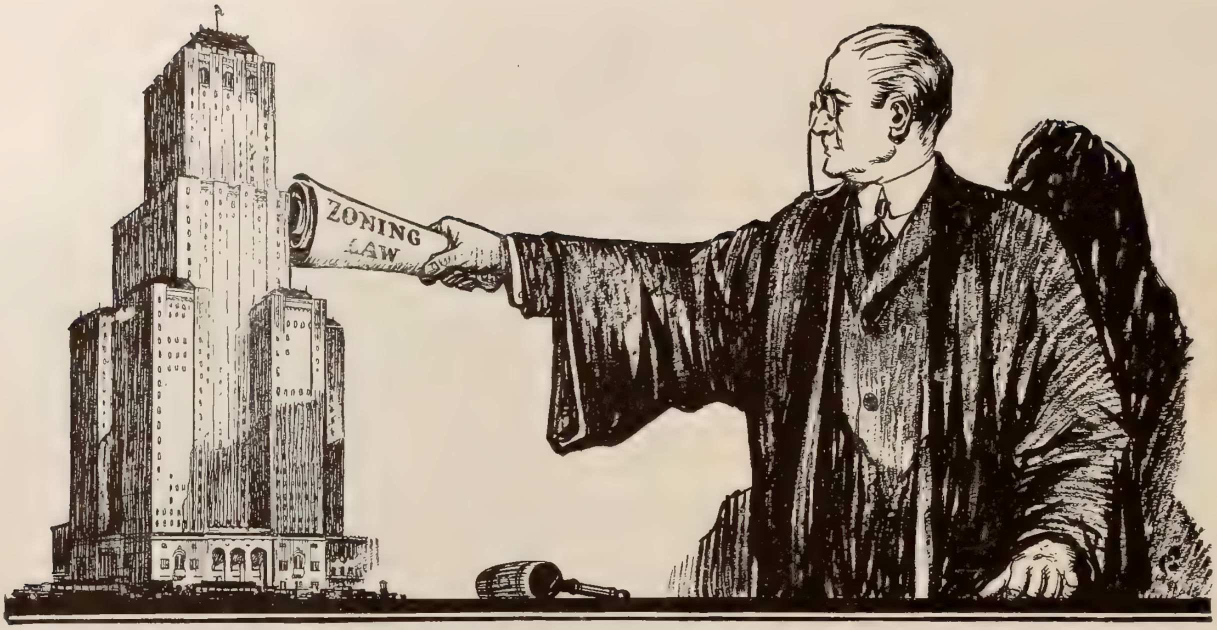

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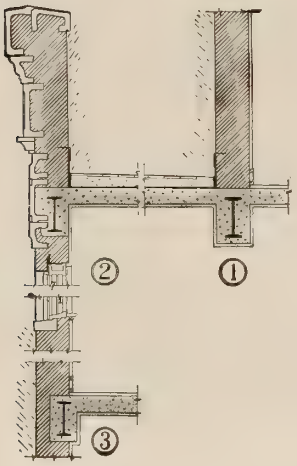

THE passage of zoning laws necessitating set-backs in the erection of tall buildings automatically created new waterproofing and damp-proofing problems. These set-backs are potential sources of interior damage unless adequately protected against the entrance of moisture.

Section 1 of the accompanying drawing illustrates a wall set back from the building line. Note the unprotected fire-proofed beam, the abutting concrete floor, and roof slabs of cinder concrete which are too porous to prevent the entrance of water into the building.

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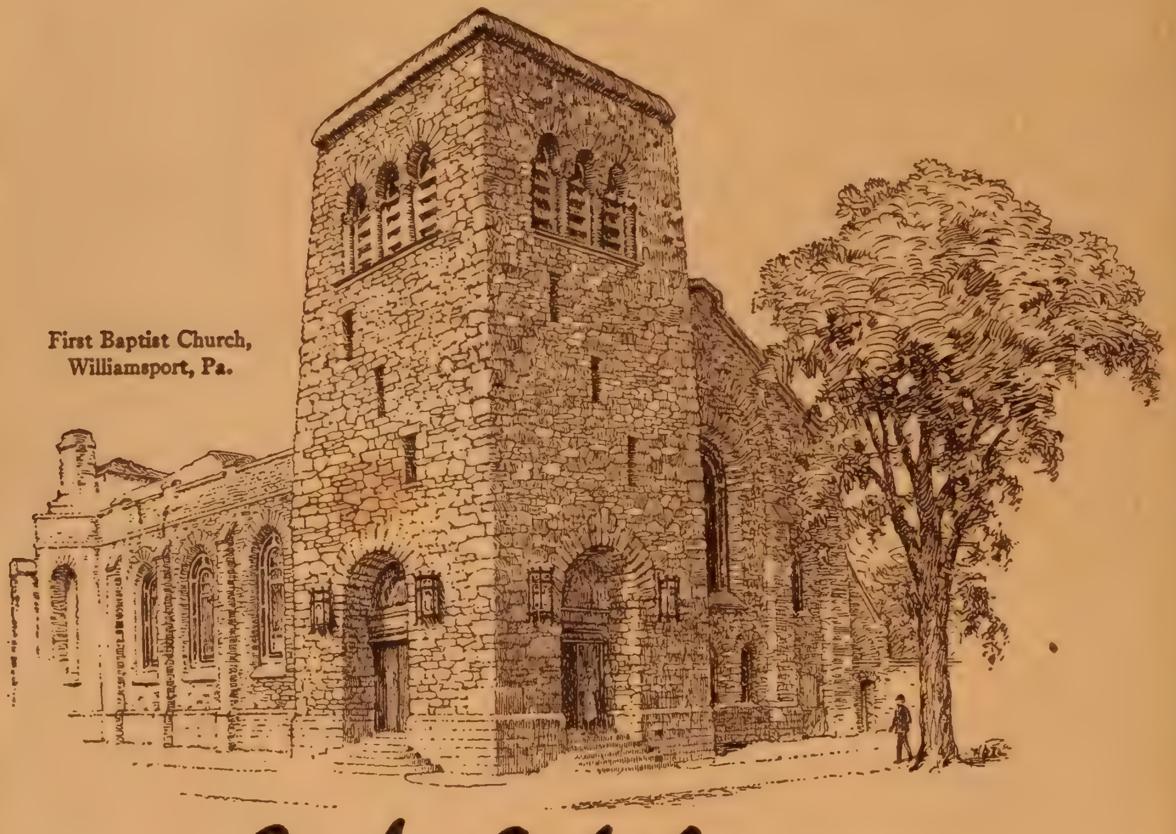

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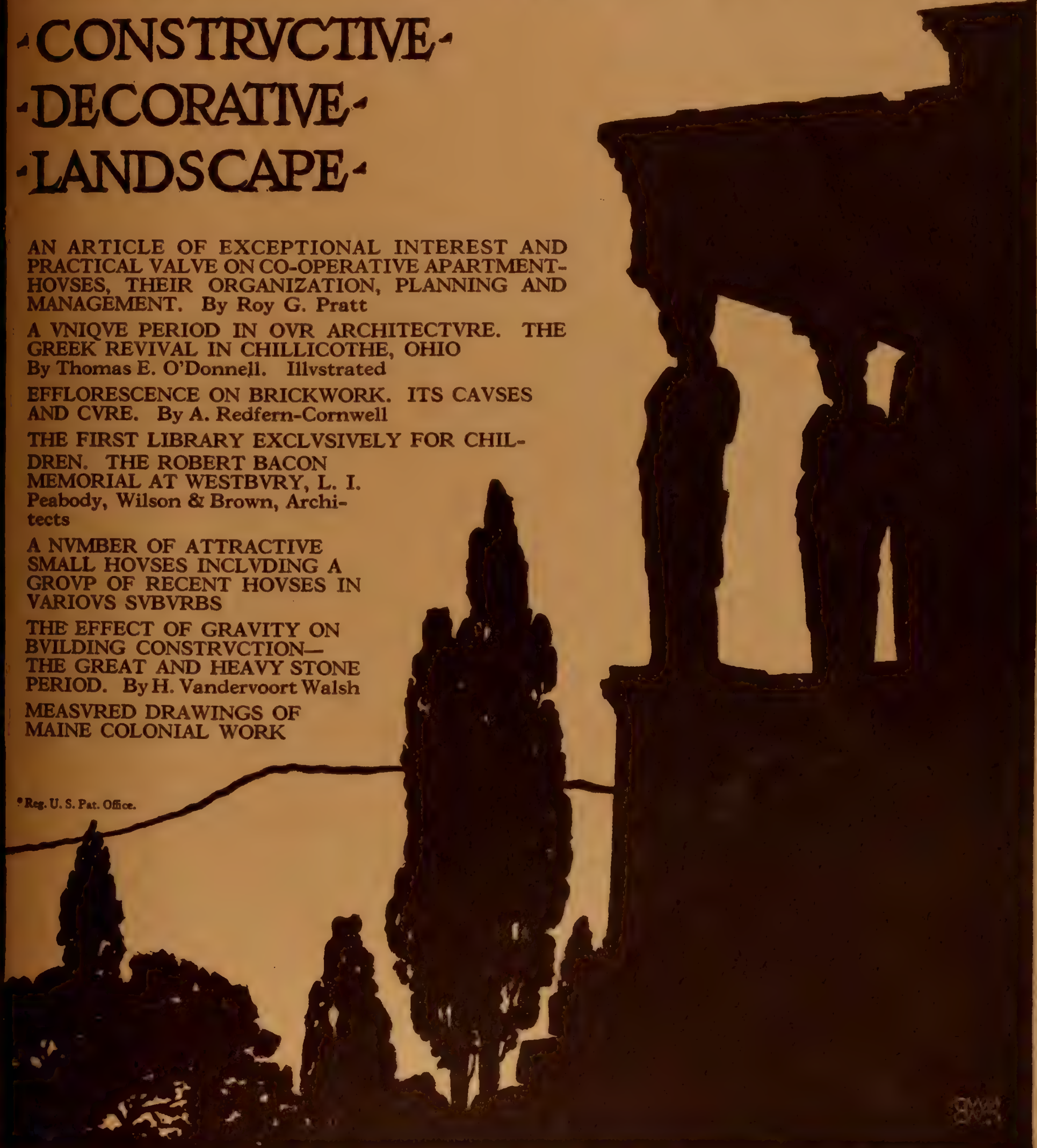

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CO-OPERATIVE APARTMENTS
CHICAGO, ILLINOIS
Comprising 162 Apartments

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No. 423 KEWANEE PORTABLE
FIREBOX BOILERS
Radiation Rating 25,000 Feet Each
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KEWANEE RADIATORS
42,000 Square Feet Direct Surface

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"SOMETHING better"—which ought to cost more—actually costs *no* more and *frequently costs less!*

In this fact you'll find the reason why so many Fenestra Casement Windows are being specified for American homes, both large and small. And the "something better" side of the question usually has a much greater influence in the choice than the "lower cost."

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C. W. Ditchy
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Architect—Glenn E. Routier

Home of James Mitchell, Cleveland, O.
Architect—James Mitchell

Home of Gordon Fernley, Interior
Detroit, Mich.
Architect—Ricardo French

Casement Windows Residences

Fenestra Casements serve the owner's interests by providing more light and better control of ventilation. They cannot warp nor stick. They can be washed easily from the inside. They can be most attractively screened and draped. They conserve wall space. All of these advantages meet the housewife's ideas of what a "window should do."

On these pages are a few Fenestra installations which indicate the versatility of Fenestra Casements. That you may properly consider the use of Fenestra on your next operation, we will gladly send you our new Fenestra Casement booklet together with a complete set of architectural details.

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schools and institutions
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AND HIGH GRADE ROOFING TIN PLATES

An alloy of Copper and Steel gives greatest rust resistance and satisfaction for building construction — roofing, gutters, spouting, and all sheet metal work.

The destructive enemy of sheet metal is *rust.* It is a well established fact that an alloy of copper gives to Steel Sheets and Tin Plates the maximum of *rust-resistance.* Keystone Copper Steel is unequaled for roofing, siding, spouting, gutters, culverts, metal lath, and similar uses. It assures roofs and sheet metal work that will withstand the ravages of fire, wear and weather. Shall we send proofs from actual service tests? We manufacture Steel Sheets and Tin Plates for all purposes and specially adapted to the requirements of architects and builders: Black Sheets, Special Sheets, Apollo and Apollo-Keystone Galvanized Sheets, Corrugated Sheets, Formed Roofing and Siding Products, Roofing Tin Plates, Bright Tin Plate, Black Plate, Etc. Sold by leading metal merchants. Our products represent the highest standards of quality and utility. Write for quotations, also our booklet, *Copper Steel Roofing Tin.*

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This new building of the great Department Store of Detroit, The J. L. Hudson Company, includes among its widely varied activities a jewelry and plating department.

Duriron acid-proof drain pipe safeguards this enterprise, because acids are used; and it provides what amounts to "paid-up insurance" against damage both to the structure and the material stocks.

Duriron drain lines are the essential specification wherever acids are employed. There is no "or equal."

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UBSTANCE · FORM · AND · COLOR

California Palace of the Legion of Honor, San Francisco. The gift of Mrs. A. B. Spreckels. George A Applegarth, Architect.

Concrete, finished with Atlas White, chosen for Permanence and Beauty, also resulted in Economy

TODAY, a perfect copy of the French Palace of the Legion of Honor stands in San Francisco—a memorial to the California Soldiers who went overseas during the World War. To insure permanence, to secure a certain soft color, after a vain search had been made for a atural stone having the desired qualities, the engineer recomnended concrete—for now, through Atlas White, any color s obtainable in concrete.

The new building is permanent and firesafe, built of renforced concrete and finished in stucco made with Atlas White ortland Cement. The delicate color of the stone used on the riginal palace in France was reproduced exactly, and though conomy had not been considered, the building's cost in concrete was $250,000 less than it would have been in stone.

Modern buildings—residential, public or commercial—are firesafe and permanent when constructed of concrete. The use of Atlas Portland Cement, which is made in pure white as well as the usual grey, enables the builder to secure a wide range of texture and color, both for exterior work and interior decoration.

The men who make Atlas are proud to have helped develop it from a material first used for sidewalks and canals, into a material that adapts itself to any modern construction, wherever permanence, beauty and economy are desired. The responsibilities of the makers have grown greater rather than less. How these responsibilities are being met is indicated by the fact that Atlas is known as "the Standard by which all other makes are measured."

Between the Atlas plants and the user there is but one distributor—the building material dealer—who brings Atlas to the public cheaper than by any other method. Any architect, contractor or prospective builder is invited to write this Company regarding the possibilities of concrete, made with Atlas.

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Portland Cement

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CHICAGO BIRMINGHAM INDEPENDENCE, KANS.
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For the Bungalow – the Pretentious Home – the Monumental Structure

RUSSWIN—that's the name to remember for a combination of beauty, permanence and trouble-free operation so essential in hardware for the home.

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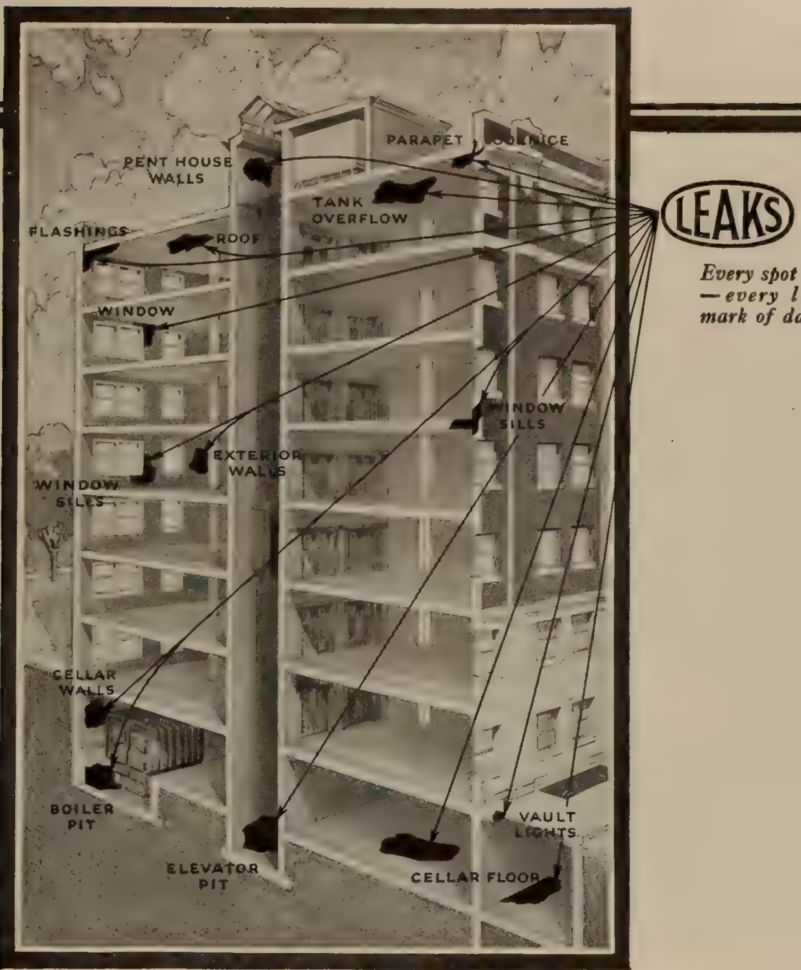

Every spot a leak — every leak a mark of danger.

Guard against leaks! Their toll is tremendous!

A Few GF Waterproofing Products

- *GF Integral Waterproofing Paste* (*GF 10*). Mixed with the gauging water to waterproof mass concrete.
- *GF Membrane Materials.* For walls and surfaces under hydrostatic pressure.
- *GF Transparent Waterproofing* (*GF 100*). A brush coating for waterproofing concrete, stucco and masonry surfaces.
- *GF Cement Paint* (*GF 102*). For decorating interior and exterior surfaces of brick, concrete, tile and stucco.
- *GF Damp-proofing Coating* (*GF 200*) A brush treatment for masonry surfaces to be plastered.
- *GF Plastic Cement* (*GF 250*). A plastic waterproof cement.
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- *GF Cement Accelerator* (*GF 12*). Quickens setting of cement and prevents freezing of mixture.

EVERY year leaks take a tremendous toll from concrete buildings. *And it is absolutely unnecessary!* GF Waterproofing Paste (GF 10) will make concrete impervious to water—dampness—seepage.

Merely dissolve GF 10 in uniform proportions in the mixing water and the concrete becomes dense and permanently waterproof. Also it positively prevents spalling and cracking.

GF Waterproofing Paste costs very little. It adds no supervision or labor to the cost of construction. Certainly it offers worthwhile protection to any building owner—avoids all the expense that can be laid at the door of moisture.

You will find the "Waterproofing Handbook" full of usable information on the latest and most approved waterproofing methods. A copy will be sent you on request.

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ANY desired degree of luster may be obtained by blending Liquid Granite (gloss) with Liquid Granite (dull).

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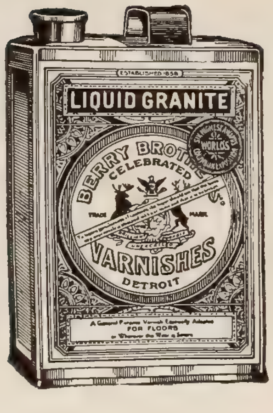
We unhesitatingly recommend the blending of Liquid Granite for all high-grade work and will gladly furnish additional information upon request.



"Save the surface and you save all"—Paint & Varnish

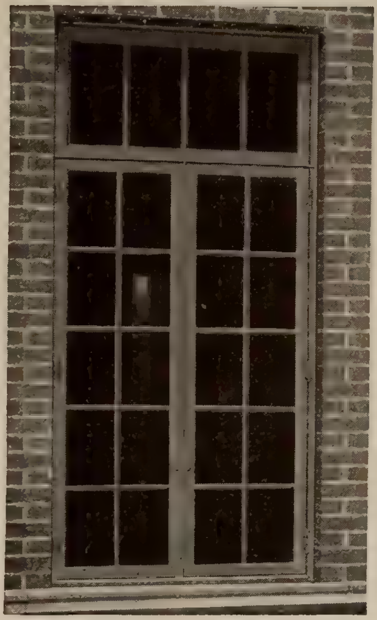
BERRY BROTHERS INC.

Varnishes Enamels Stains

Detroit, Mich. Walkerville, Ont.

Kawneer
Solid Nickel Silver
WINDOWS

Among the many important features of these windows are permanency, adequate weathering and minimum upkeep. These, when combined with ease of operation and lines which harmonize with any type of building, assure economy and satisfaction.



Exterior view of Kawneer Nickel Silver Window in modern, fireproof office building. *Above:* interior view of same window.

Kawneer
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Kawneer Resilient Store Front construction affords the architect an efficient member for every requirement from lintel to floor and from wall to wall. Kawneer can be specified with complete assurance that your client is getting the best.

Estimates or information pertaining to Windows or Store Fronts furnished upon request.

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Kawneer
COMPANY
NILES MICHIGAN

Keep Right On Building This Winter

Bears and ground hogs still hibernate. But engineers, architects, contractors and building owners don't let winter drive them to cover.

They know that "time is money"— that winter is just as good as any other time to build; so they keep on building in cold weather.

The building industry, as well as the public, recognizes that this practice is not only practical but usually profitable for all concerned.

Winter construction means that builders can continue their work without interruption through twelve months. The builder's crew, which has been trained to maximum efficiency, can be kept intact and steadily employed with profit to everyone.

Winter construction by providing quicker occupancy, brings to the owner an earlier return on his investment.

During the winter there are few delays in getting material. Sand and stone are usually nearby; cement is obtainable on short notice practically anywhere. And these materials come to you ready for use—you make your building right on the job.

In winter, as in summer, concrete is the last word in speed of construction—the champion time saver.

If you have not yet experienced the advantages of winter building, plan now to do so.

And remember, where "time is money" use concrete.

* * *

The few fundamental principles of cold weather construction are simple and easy to apply. If you are not familiar with them, ask our nearest District Office for literature on winter building. There is no obligation.

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A National Organization to Improve and Extend the Uses of Concrete

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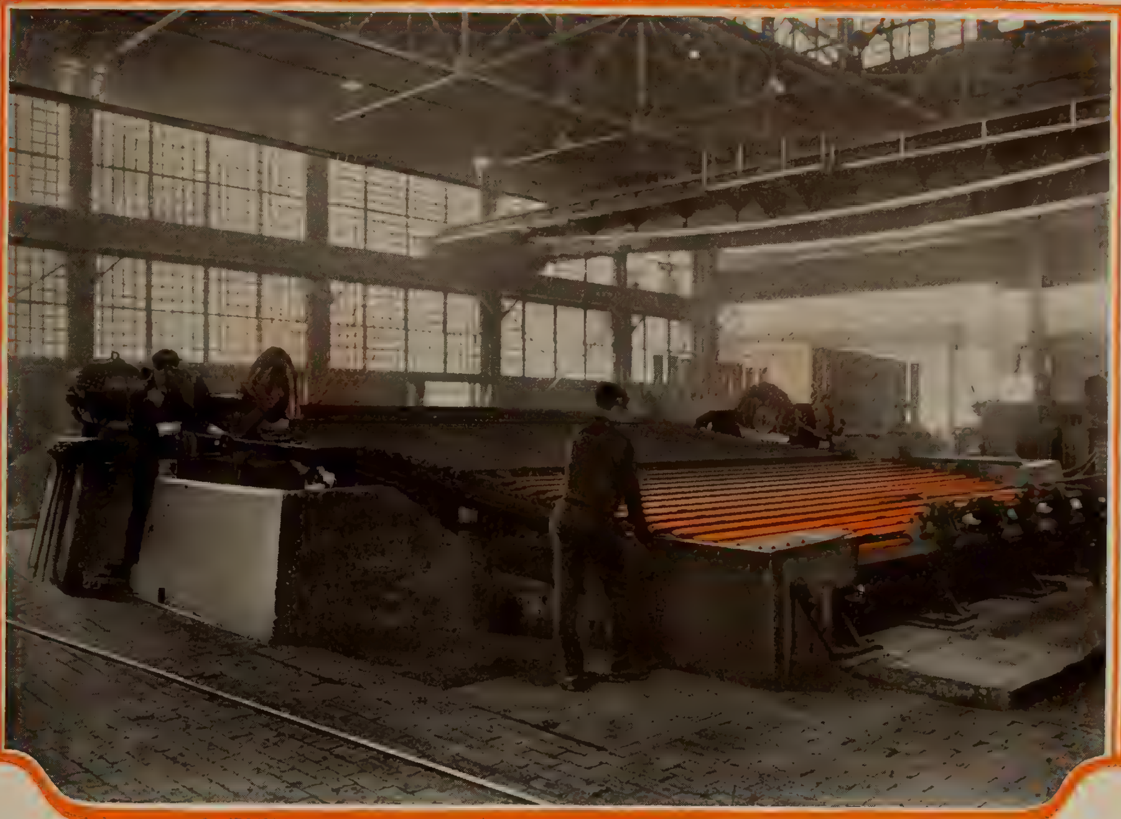

The Cooling Rack in the "Central" Plant
Inclined table where "Central" Pipe is straightened and slowly cooled

The 4th Operation in the Making of "Central" Pipe from which is Made "Central Black" and "Central White" Conduit

FROM cottage to skyscraper "Central" Pipe and "Central" Conduit are contributing to safe, sound, permanent construction. This is No. 4 of a series prepared to give architects and engineers a thorough, intimate knowledge of manner and methods of "Central" manufacture.

AS "Central" Pipe emerges from the cross rolls it enters the dump trough shown at the extreme right of illustration. As each successive pipe clears the cross rolls the cover of the trough is lifted, allowing the pipe to roll onto the cooling rack.

The pipe is rolled slowly up this rack by fingers attached to continuously traveling chains. The rolling action has a two-fold effect, straightening the pipe and allowing it to cool slowly without any one part of the pipe being in constant contact with the cold metal of the rack.

The pipe comes from the sizing and cross rolls with irregular ends and the extreme ends of the pipe are apt to be imperfectly welded. High speed hot saws cut these ends squarely from the pipe as each piece is drawn against the saws by the traveling chain.

CENTRAL TUBE COMPANY

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PITTSBURGH
DISTRIBUTORS IN ALL LARGE CITIES

HAROLD FIELD KELLOGG, ARCHITECT

KENNETH M. DE VOS AND C. C. MITCHELL, BUILDERS

Alden Park Manor—*Boston*

This remarkable apartment building has unusual features of design which have aroused wide-spread comment. Notable among these is the provision for deliveries, all of which are underground, no delivery wagons being seen in the property surrounding the building.

Throughout this building (or rather group of three connected buildings) metal trim is used. This trim is finished with Sherwin-Williams Opex, the perfected lacquer finish. Opex was selected for its extraordinary fast-drying qualities, its smoothness, its ease and speed of application and its truly amazing durability.

Correspondence is invited by Sherwin-Williams on the subject of Opex as a lacquer in building construction. Write for the attractive Color Card.

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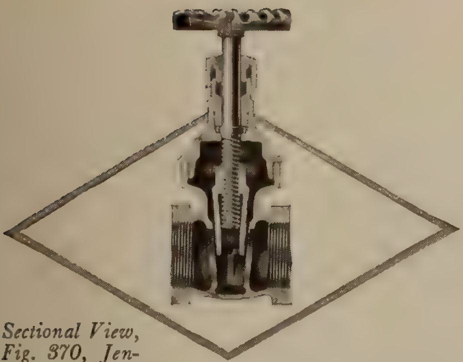
OPEX

THE PERFECTED LACQUER

A SHERWIN-WILLIAMS PRODUCT

Where Jenkins Valves are permanent residents



Sectional View, Fig. 370, Jenkins Standard Bronze Gate Valve.

Apartment House at 455 East 51st St., New York, in which Jenkins Valves are used. Treanor and Fatio, Architects, J. E. R. Carpenter, Associate, Weibert-Ziebold Corp., Brooklyn, Steam Contractor.

Fig. 715 Jenkins Bronze Fire Line Angle Valve.

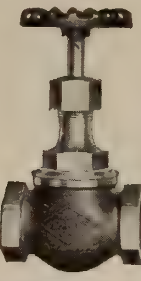


Fig. 106 Screwed, Jenkins Standard Bronze Globe Valve.

Apartment house at 47-55 East 66th St., New York, in which Jenkins Valves are used, Mott B. Schmidt Architect; W. G. Cornell Co., Plumbing Contractor; J. H. Merritt & Co., Heating Contractor.

In apartment houses Jenkins Valves are permanent residents, for, once installed, they stay.

This permanency is the result of making a valve as well as it can be made. In design no detail is slighted, nothing is skimped; the metal mixture and melt are scientifically controlled; the castings are sound; the machining is precise; the assembling careful; the inspection constant during every step of manufacture. Finally a test is given—a test of ample margin to insure a valve that withstands maximum service, not merely average service.

Jenkins Valves represent the kind of equipment that architects seek, in providing buildings which may be economically maintained. For apartment house plumbing, heating and fire protection service, you can place confidence in these valves.

The Jenkins "Diamond" mark is important, because without this symbol no valve is a Jenkins. For genuine Jenkins service, please specify Jenkins "Diamond" marked valves.

You are invited to write for a book of Jenkins Valves for apartment houses.

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SINCE 1864

Horse Head Zinc conductor pipes, eaves-troughs, gutters, and roofing are for moderate priced homes as well as for pretentious dwellings. To the owners of both, they make the same appeal—long life, low cost, and uninterrupted service.

Horse Head Zinc is durable—it will last a lifetime. Being durable, its first cost is the only cost. No repairs; no replacements.

And the first cost is surprisingly low—lower than that of any other comparable permanent metal.

Horse Head Zinc conductor pipes, eaves-troughs, gutters, and fittings in all standard shapes and sizes are always available through your local sheet metal contractor.

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Established 1848
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THE day of frequent rug replacement is passing. People are learning to buy rugs for their sturdy worth, as well as for their beauty.

You can get out of any rug only what its maker puts into it. The wear a rug will stand is proportional to the amount and kind of wool it contains.

"Hartford-Saxony" rugs are a full half-inch high. Of course they wear longer than rugs only half that height. And the yarn they are made of is a great deal thicker, sturdier and softer—more pleasing to walk on and more luxurious in appearance.

"Hartford-Saxony" rugs are absolutely unrivalled in beauty and durability. In hotel lobbies and corridors there are more yards of "Hartford-Saxony" carpets and rugs than of any other American-made fabric. But they are not just hotel rugs. Thousands of homes have long used them, many for twenty-five years or more.

There are 90 patterns and 28 sizes to choose from and special sizes can be made to order. If you do not find at your dealer's just what you want, let us send you a set of pattern illustrations and a new booklet describing "Hartford-Saxony" rugs and showing typical room scenes in colors.

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"Hartford-Saxony" Rugs

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LOOK FOR THE FULL NAME WOVEN IN THE BACK AS A GUARANTEE OF QUALITY

The "Hartford-Saxony" rug illustrated below is Pattern 1740, Color 44.

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THEY CANNOT COME APART

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Union Free School, Seneca Falls, N. Y., Univent Equipped. Tooker & Marsh, New York City, *Architects*

The Unseen is so Important

Tacitus spoke wisely when he said: "They shone forth the more that they were not seen."

The architects of America have urged and proved the benefits of the unseen in school planning. Light, sanitation and ventilation—three vital essentials—were haphazard considerations until the American architect became insistent upon their betterment.

Ventilation is unseen—until after its effects are shown. Air can be blown into a room by Mother Nature or by any means—without providing real ventilation. True ventilation means a steady supply of fresh, clean, *pure* air, in motion.

Univent gives this unseen, important necessity. It does not depend upon outside weather conditions. It cleans the air, if needed. It warms the air, if necessary. It supplies the proper quantity of fresh, clean, purified air, with a pleasant, breeze-like motion, but without a draft.

The necessity, as well as the economy, of this system is shown in our Architect's Edition of Univent Ventilation. We shall be glad to send you a copy upon request. It tells why Univent is being installed in old, as well as new, school buildings.

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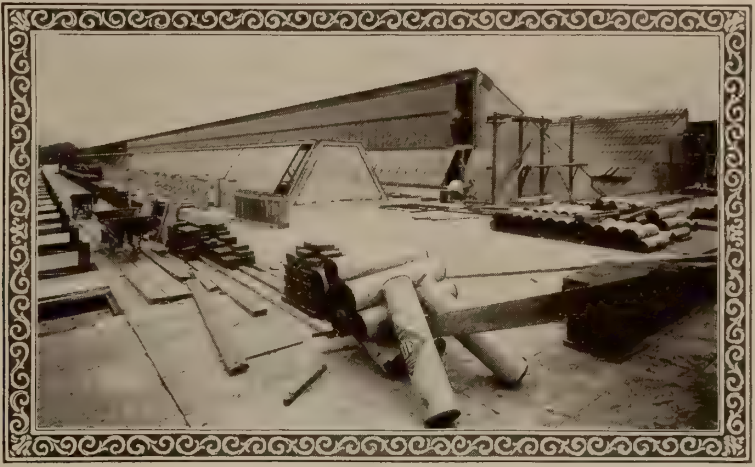


On the Louisville Ford Plant

CAREY Built-Up Roofing is used on The Ford Engineering Laboratory at Dearborn, Michigan, Plants at River Rouge and Detroit and many Ford assembling plants in different parts of the country; so it was only natural that it should have been chosen for the new plant at Louisville.

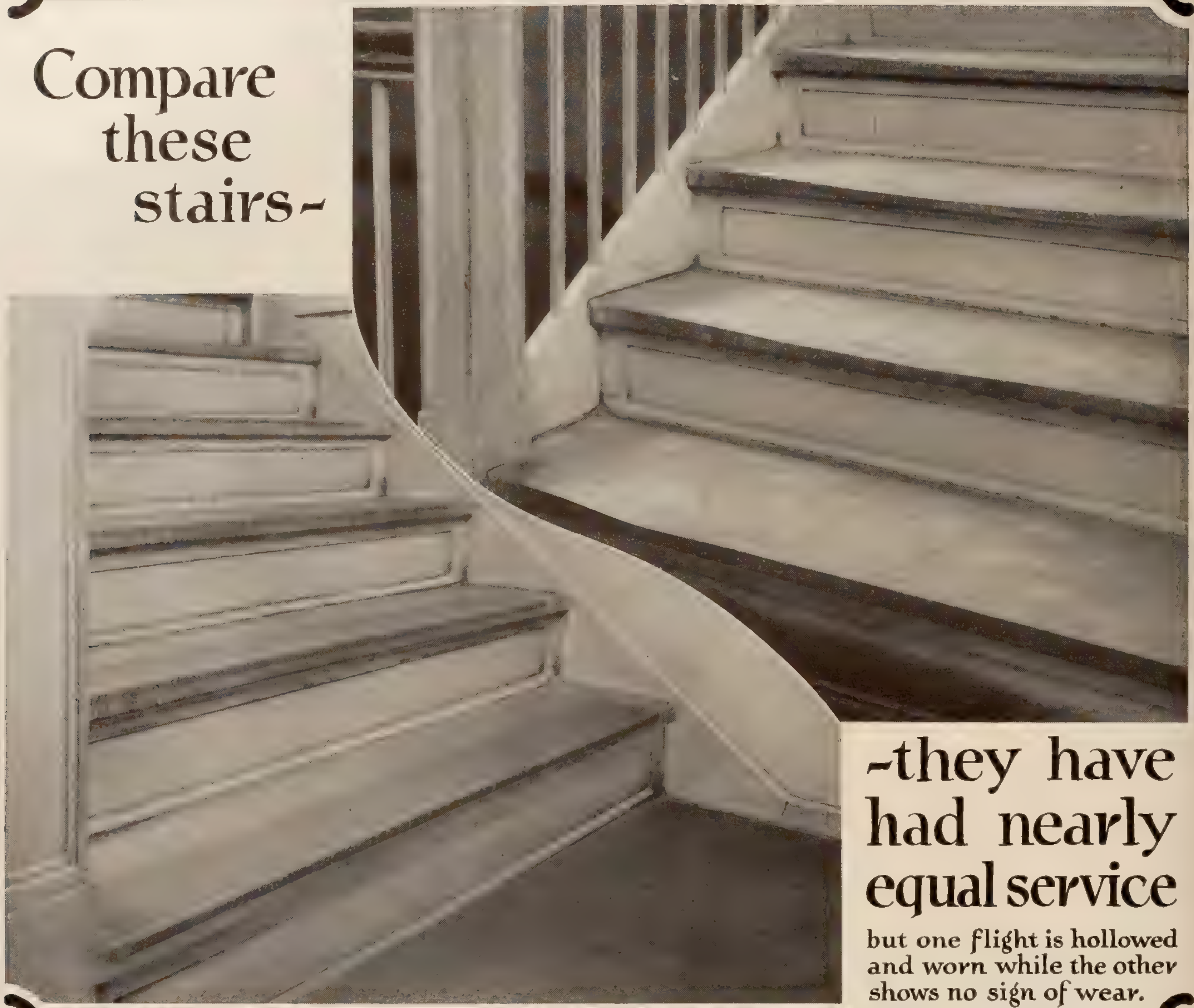
Carey roofing was built up on the steep slopes of the monitor roof as well as on the flat surfaces. The special Carey process of tempering the asphalt makes it adaptable to all weather conditions.

There are Carey specifications to exactly meet every kind of roof condition. Write for Architect's Specification Book.

THE PHILIP CAREY COMPANY
513-533 Wayne Avenue, Lockland, Cincinnati, Ohio

Carey
BUILT-UP ROOFS

10-25



Compare these stairs—

—they have had nearly equal service

but one flight is hollowed and worn while the other shows no sign of wear.

TRADE NORTON MARK

All types of Norton Floors are made permanently slip-proof, durable and quiet by the bonded electric furnace abrasive trade-marked "Alundum"—long used in the well-known Norton Grinding Wheels.

THESE two stairways are in the administration building of a large manufacturing plant. As nearly as can be estimated they have had approximately equal wear. (Well over a million people have used each.)

The stairway with nosing of Alundum Stair Tile (lower picture) has no sign of worn hollows. A straightedge laid along the nose of the treads shows them to be as true and level as when the tile was installed. The treads on the other stairway are badly hollowed and worn.

The stairway using Alundum Tile is safe (slip-proof) and without grooves or corrugations to cause tripping.

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The Miller Plan of Financing enables the owner to make a reality in concrete, steel and brick of the structure designed by an architect's pencil.

When an owner enters into a contract with G. L. Miller & Co., he puts his building enterprise on a sound basis. He knows that every precaution in planning and building has been taken to increase earning capacity. He benefits by the architectural and construction experience of the Miller organization.

The Miller Plan of Financing brings to the owner of a hotel, apartment or office structure these important advantages:

1. Periodic disbursements are made as the building is constructed.
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$250,000 *to* $1,000,000 *and more*

We are now prepared to underwrite first mortgage bond issues secured by new construction and will welcome applications in amounts of $250,000 and more. If you know of a builder who has confided that "only finances keep me from building," put him in touch with us.

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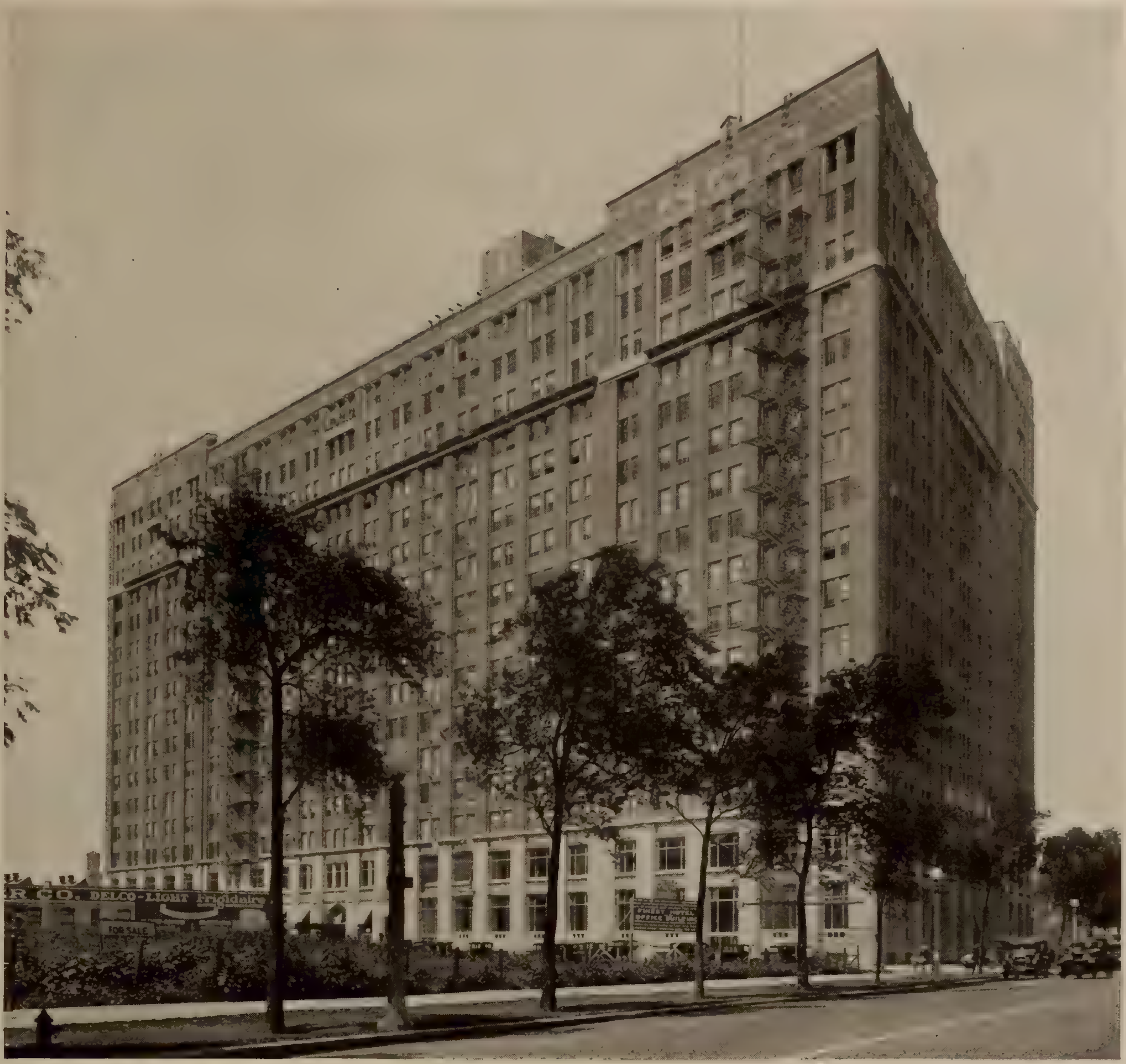

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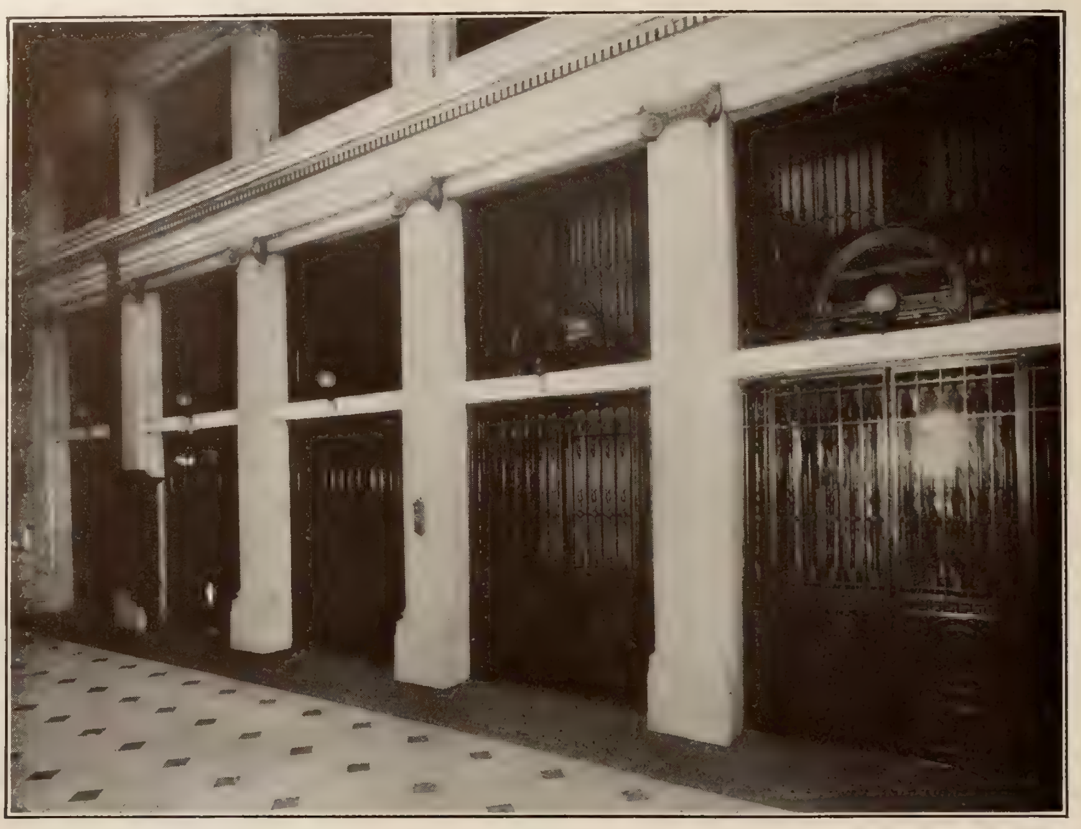

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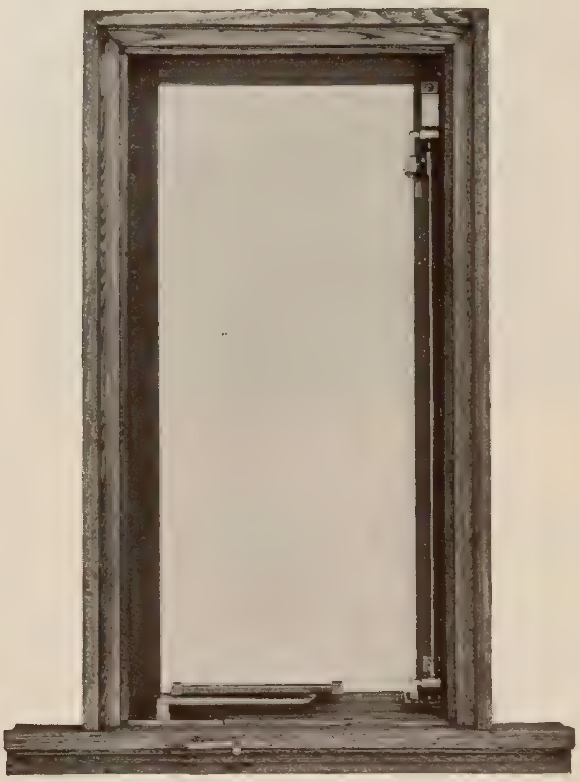

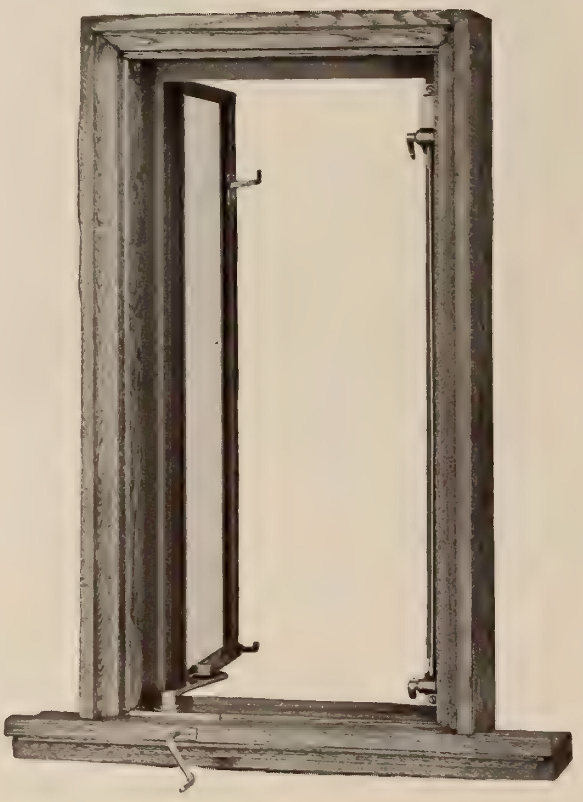

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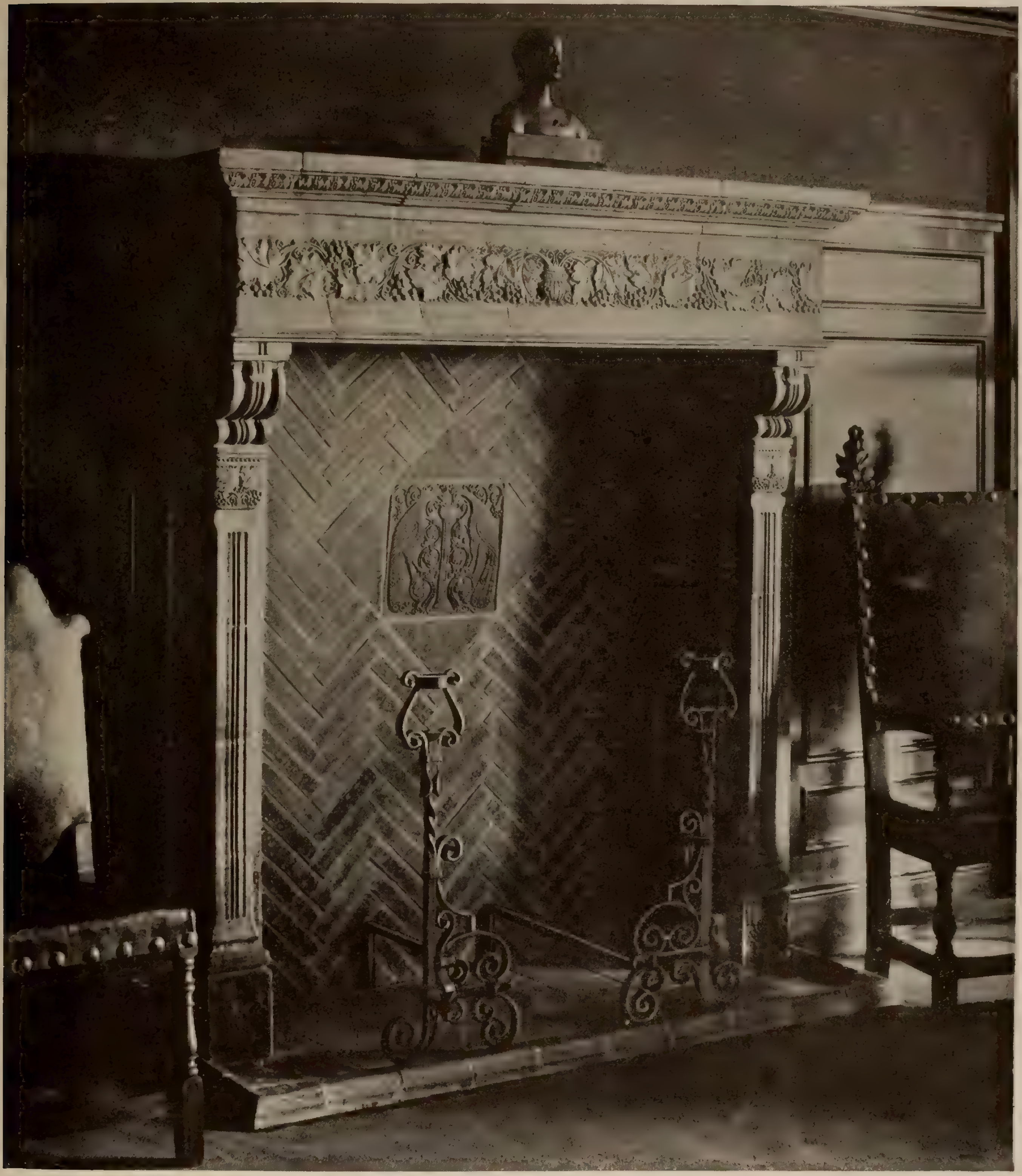

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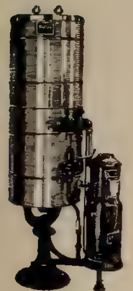

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VOL. LII. No. 4

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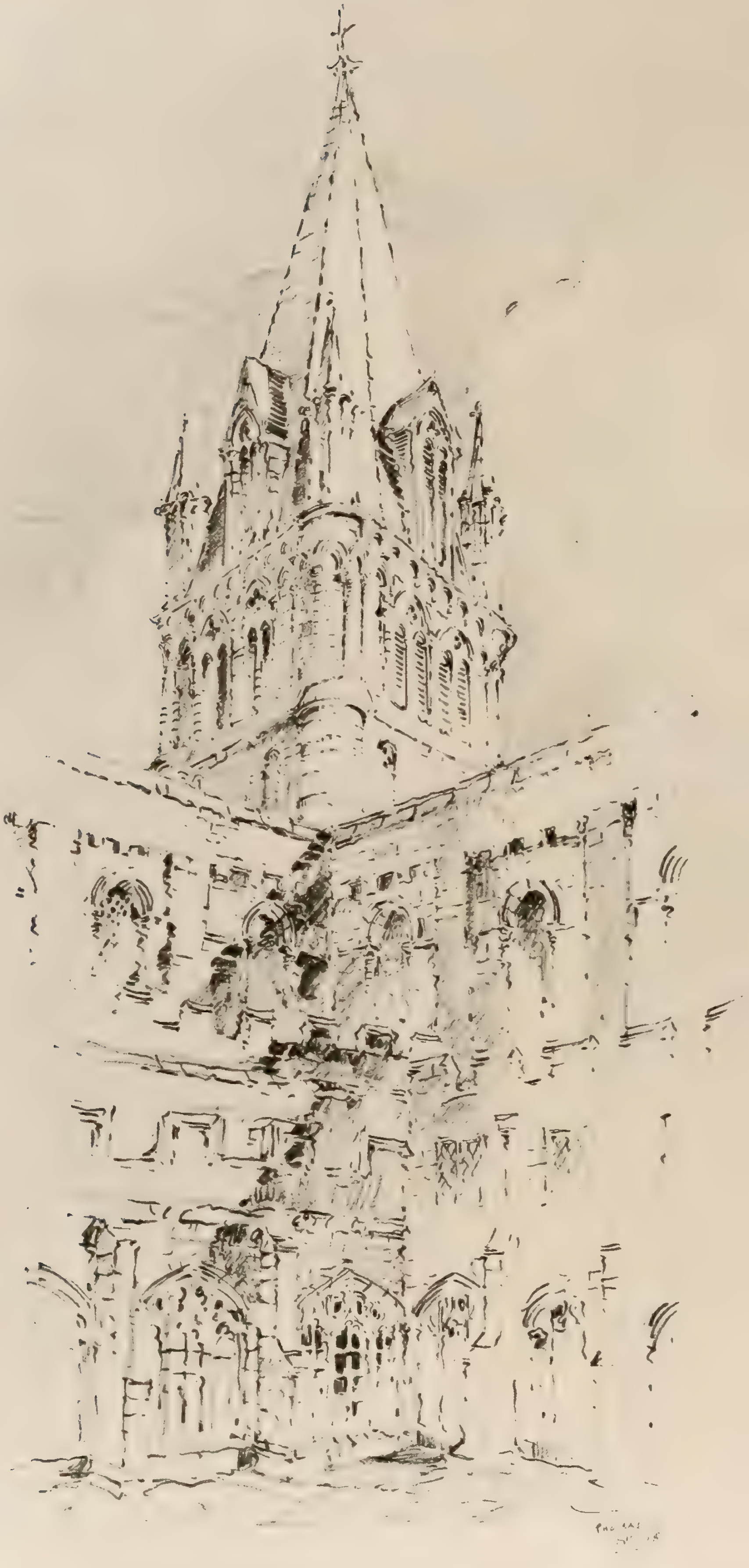

CHRIST CHURCH COLLEGE, OXFORD, ENGLAND. From the pencil drawing by Thomas E. Hibben.

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THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. LII OCTOBER, 1925 NO. 4

The Greek Revival in Chillicothe, Ohio's Old Capital City

By Thomas E. O'Donnell, A. I. A.
Assistant Professor of Architecture, University of Illinois

THERE is something peculiarly interesting about an old city which at one stage of its existence occupied an important position in the history and development of its country. In Europe such cities, because of their historic past, have acquired a note of distinction which has made them famous at home and abroad. In America, however, we have not arrived at that stage of appreciation of our cities and places of historic interest where we give to them more than passing attention. As a country we are so young that it is scarcely realized that we have had a past; we live very largely in the present. In our mad rush of commercialism, and feverish development schemes, important events and places are soon forgotten. A half-century ago Salem and a score of other New England towns possessed far more examples of fine early American architecture than can be found in them to-day, yet they were little appreciated outside of their local community. For a long period we went to England, to France, to Italy, to the classic Roman, and even back to a revival of Greek forms, as a source for a style of architecture, when at home we had what was our national heritage and logical native mode of building, which we now call Colonial.

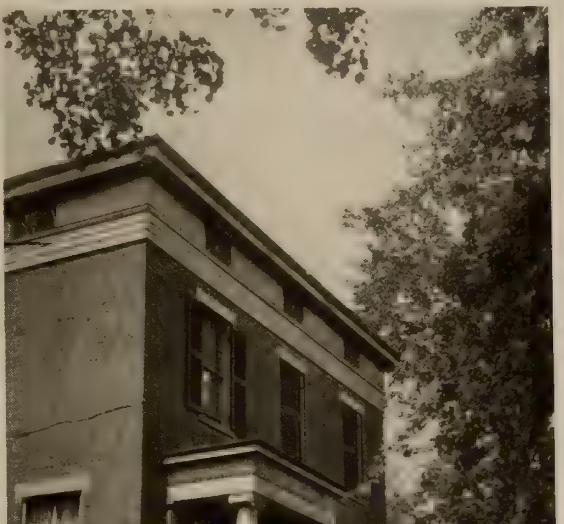


Fig. 1. The Reeves-Woodrow-Fullerton House, S. Paint Street, Chillicothe, Ohio.

Any one of these foreign types might have furnished the basic principles and architectural elements upon which to build or rather develop an architecture of our own, but one style was soon given up to make way for the next, and whatever American characteristics had been infused into one were lost in the taking up of another. It is only within recent years that we have come to a full realization of the value and possibilities of our Colonial and Georgian types as a basis for our future architectural development; at least, for certain portions of our country. After the Colonial, the only sustained early style that held sway in this country for a long enough period to have received an impress of American characteristics was the Greek revival. But, as yet, there are few who will admit that there is anything of value in our heritage of Greek revival forms. In time we may come to recognize, as we have in the case of our Colonial style, that the Greek revival was a definite step, a transitional style, in our architectural development, and that the best remaining examples of it constitute a heritage from which we may draw inspiration for future work.

In the Middle West we can boast of no city as old or containing as fine architecture as Salem. But, just as in New England there were towns which in early times rose to a place of great importance and later were left to slumber when a rival overshadowed them, so also in the Middle West, in the early days of its development, there were towns which rose rapidly to a position of near-fame only to take a second place in the scheme of things as the tide of development swept westward. There were many such in the old Northwest Territory; one of the most striking examples being Chillicothe, Ohio's old capital city. Chillicothe was laid out and settled, in 1796, by Virginians and Kentuckians. The name is of Indian origin, being that of one of the principal tribes of the Shawnees, and also the name of their village located on the site of the modern city. In 1798 a sawmill and gristmill was established on Paint Creek near the town, and following its erection there was a rush of settlers into that section. This mill was erected by Thomas Worthington, who had been appointed by General Rufus Putnam, of Marietta, as surveyor of a large district of Congress lands

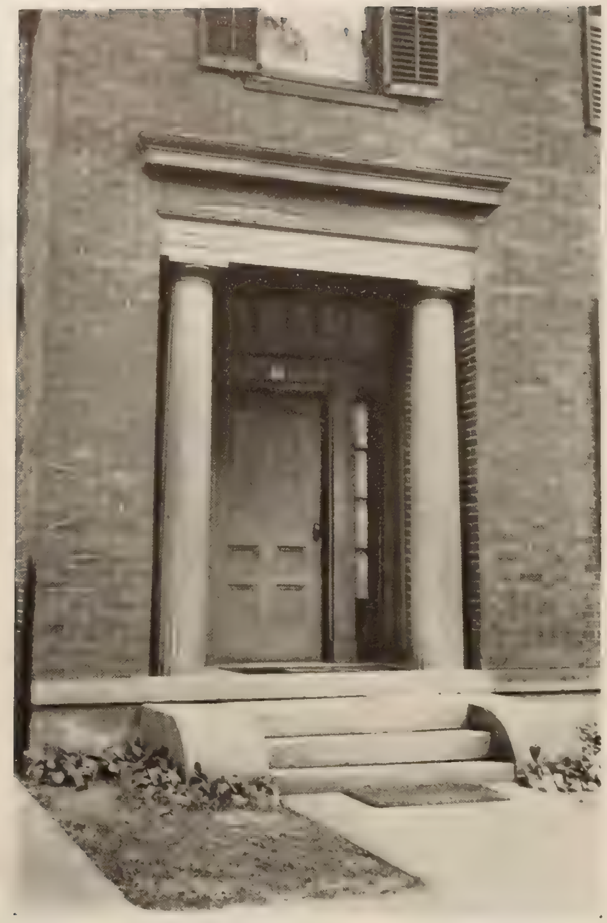


Fig. 9. Doorway of the Morris Renwick house, W. Second Street, Chillicothe, Ohio.

to the east of the new town. In 1799, a post office was established at Chillicothe, which made it a fixed centre of territorial development.

Chillicothe's real importance dates from the year 1800, when the seat of government of the Northwest Territory was removed, by law of Congress, from Cincinnati to Chillicothe. The new State House, which was begun in 1800 and completed in the following year, is said to have been the first stone public building in the Northwest Territory. The convention that framed the constitution of Ohio was held in it in 1802, and the first State Legislature met there in 1803. Chillicothe was the State capital from 1803 until 1810, when Zanesville became the temporary capital, but in the latter part of 1812 it was again removed to Chillicothe, where it remained until 1816, when Columbus was made the permanent capital city.

Thus for sixteen years Chillicothe occupied an important place in the affairs of the new State. It had grown rapidly, and through various promoters was laid out on a large scale. Investors came in, bringing considerable wealth with them, and a great era of building was experienced. From the impetus thus received Chillicothe continued to be one of Ohio's leading cities long after the capital had been removed to Columbus. Most of the fine old residences remaining today are those which were erected, not during the speculative period, but in the more settled period which dates from about 1830 to 1850. It is with the architecture of this period that this article is particularly concerned.

An index to the onetime importance of Salem is her unusually fine architecture of the period. The architecture of Chillicothe cannot compare, in many respects, with that of Salem, but it is just as expressive of the life, thought, and ambitions of the Middle Westerner of the forties as that o the eastern city is of the New Englander and his time. Each marks an important step in the architectural development of America.

The period of Salem's greatest growth came at a time when the Colonial and Post-Colonial were at their height. Colonial precedent was so well grounded there that the Greek revival, which dates generally from 1800 to 1855, had little effect upon her architecture. Salem continued to build largely after her native or early style. But in 1800 Chillicothe was but a primitive town in the heart of the great forests of the Northwest. There was no precedent to follow—all was new. Western towns have always taken pride in being up to date, consequently Colonial architecture, which was considered old fashioned, did not appeal to them. The Greek revival, the new mode of building, which was making its appearance in many eastern cities, was hailed as the appropriate style for giving expression to our "national importance." It was early introduced into the ambitious western town, and after 1830 became the prevailing style for the more important and pretentious buildings. Many examples still remain which give the city a refined, dignified, and aristocratic atmosphere. Unfortunately a great fire swept through the main portion of the town in 1852, and as a result most of the Greek revival buildings of a civic and commercial nature were destroyed, leaving only some of the finer residences to indicate the character of the work here during the period.

Most of the larger brick residences show traces of this style in some of its forms. Many old houses had a "classic" porch added over what was, in reality, a Colonial type entrance. Details, ornament, and mouldings were the first

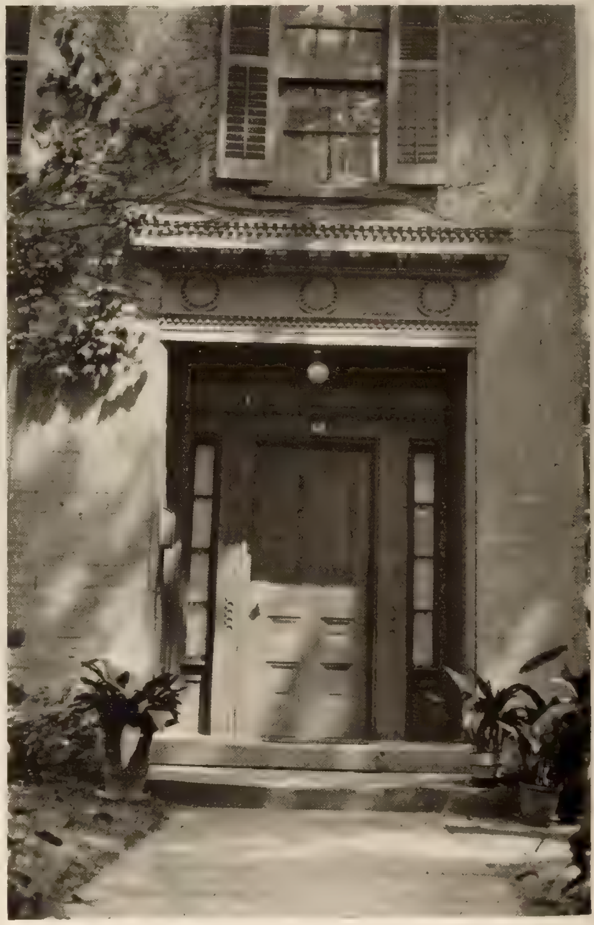


Fig. 10. Simple recessed doorway, Watt-Safford house, Chillicothe, Ohio.

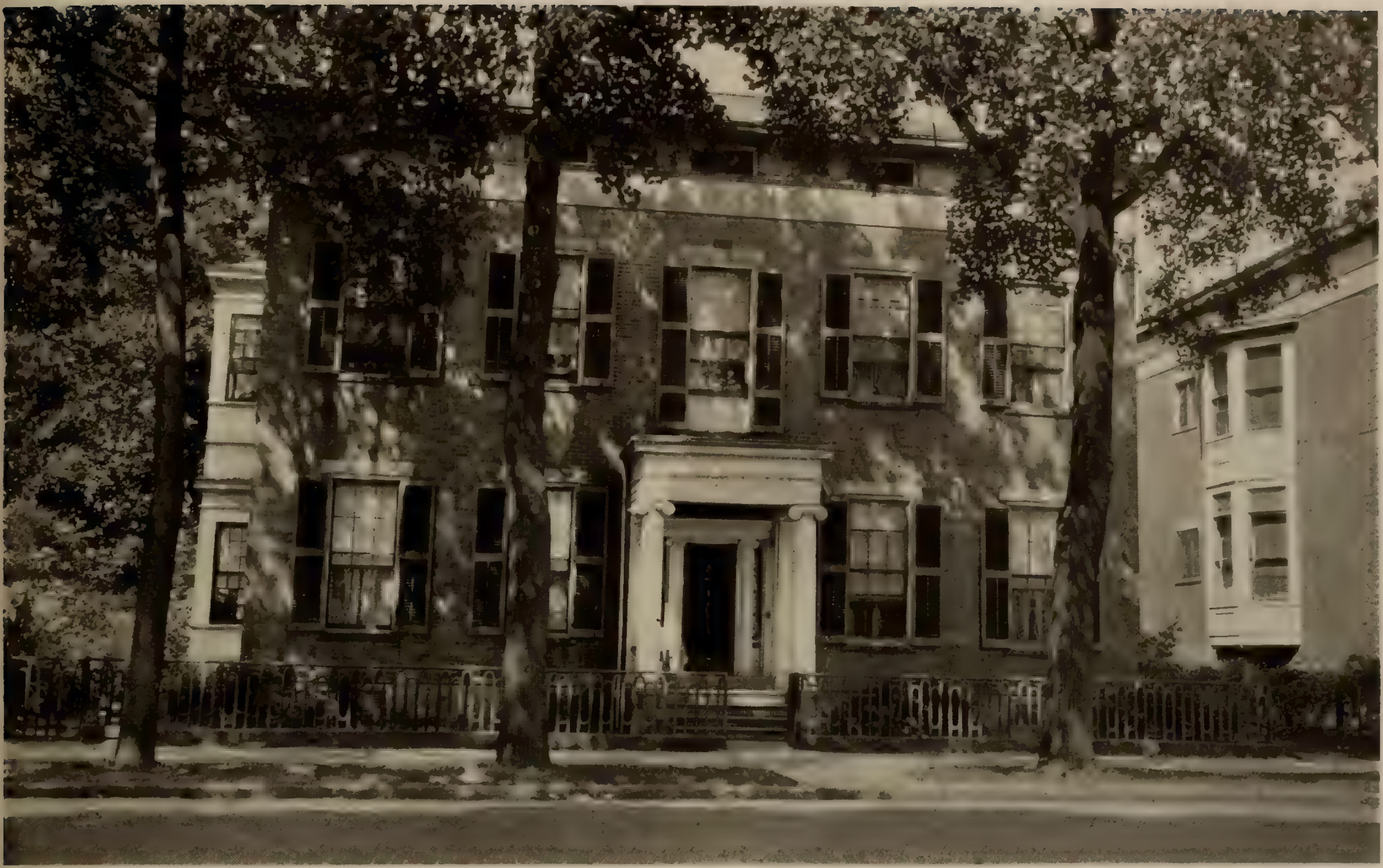


FIG. 2. THE McLANDBURGH–FULLERTON HOUSE, S. PAINT STREET, CHILLICOTHE, OHIO.

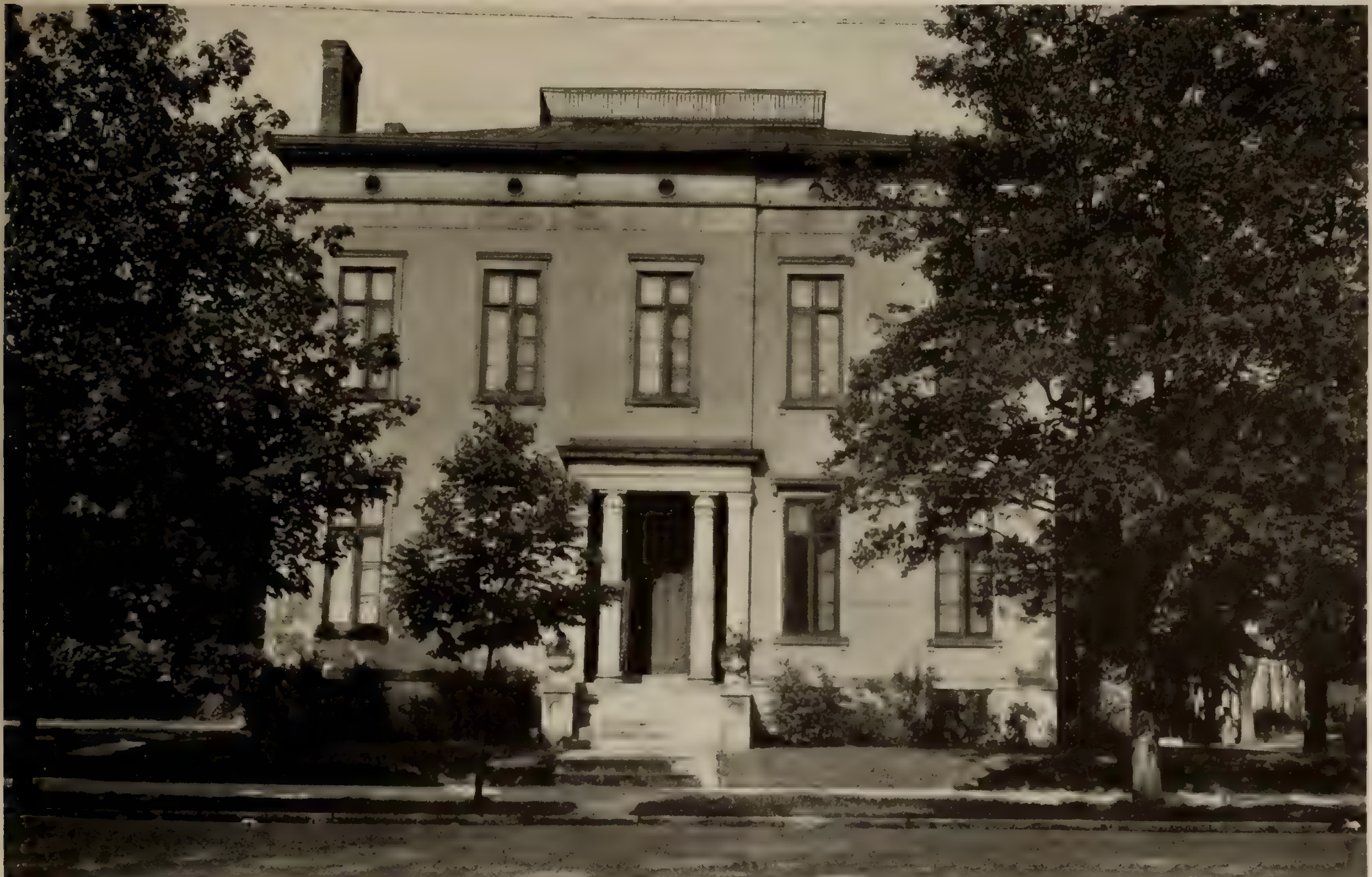


FIG. 3. THE ATWOOD–WILSON HOUSE. S. PAINT STREET, CHILLICOTHE, OHIO.

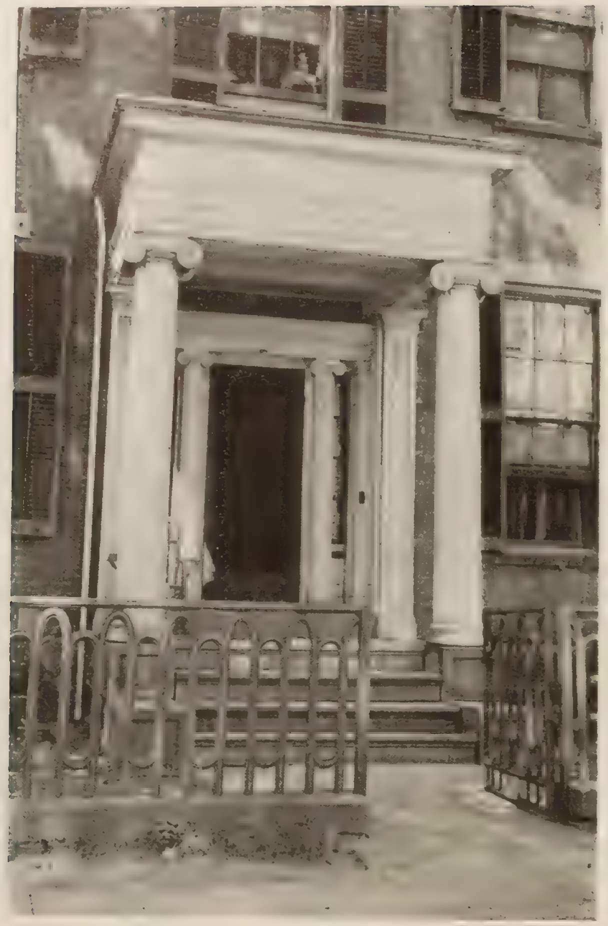


Fig. 5. Entrance porch and doorway, the McLandburgh-Fullerton house, Chillicothe, Ohio.

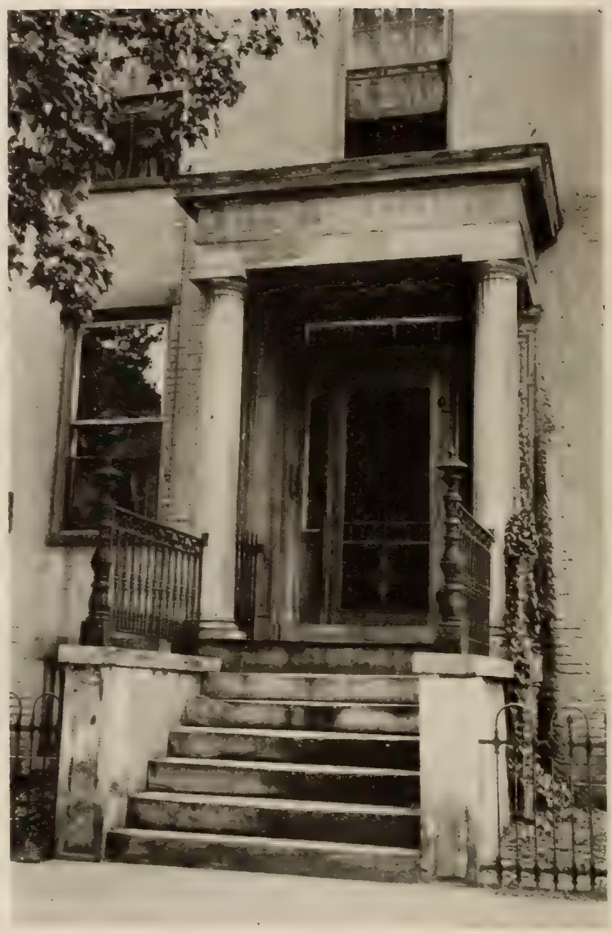


Fig. 6. Entrance porch and doorway, the Carlisle house, Chillicothe, Ohio.

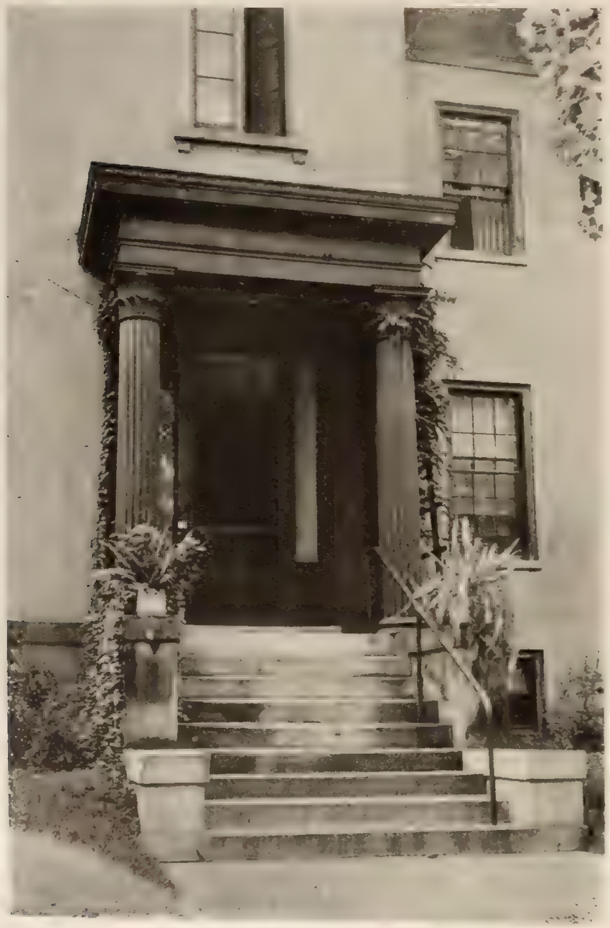


Fig. 7. The side entrance of the Atwood-Wilson house, Chillicothe, Ohio.

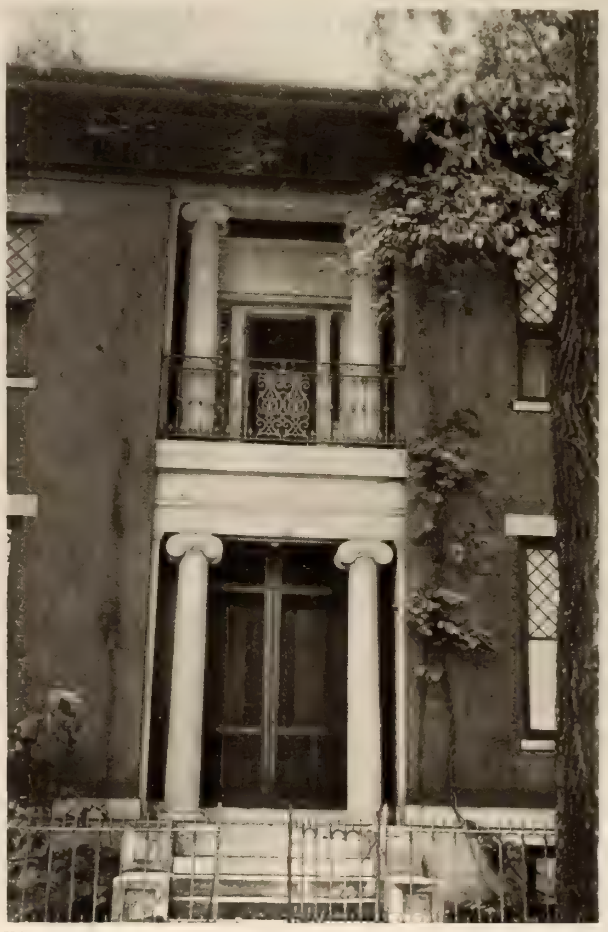


Fig. 8. Entrance and central motif of the King-Fullerton-Brown house, Chillicothe, Ohio.

to show the influence of the Greek revival. This was perhaps due to the fact that there was an abundance of good timber and that the sawmills and planing-mills were highly developed and manned by skilled woodworkers. It was easier and far more economical to work out architectural details in wood than to carve them in stone. There is evidence also of the use of carpenters' hand-books, for well-known hand-book motives are found repeated in many places throughout the town. The working out of details and proportions of the Greek orders and other architectural elements of the entrance porches and doorways shows a careful following of the book details. Due to the fine quality of the wood used, and the excellent craftsmanship of the time, there is much of this fine old woodwork remaining, as shown in the accompanying illustrations.

Paint Street, Chillicothe, is the counterpart of Chestnut Street in Salem. Along this old shaded thoroughfare are to be found many of the finest houses of the Greek revival in the city. But not all of the best work is confined to this one street; Main, Second, Fourth, and Fifth Streets have many fine examples still remaining. Chillicothe has not developed into a large, rapidly growing commercial centre, consequently many of these fine examples of early American architecture are preserved for us.

Most of the Greek revival houses of Chillicothe of this period are of the large, square, two-storied type, usually of brick with wood trim. As in the noted eastern city, the doorways and entrance porches are the outstanding features of most of them, and it is in these that the Greek motifs are most insistent. All three Greek orders are found: the Doric. Ionic, and Corinthian. In some rare cases the orders are omitted entirely, but the design is unmistakably in the proportions and spirit of Greek work.

The Reeves-Woodrow-Fullerton house (Fig. 1) is a typical plain, square, two-storied brick structure of the period of 1847. The Greek Ionic porch is the chief feature, and it is further enhanced by the imposing flight of stone steps and fine old wrought-iron step railing. Aside from its architectural merits, this particular house is of historic interest, for it was for a number of years owned and occupied by Thomas Woodrow, an uncle of the late Woodrow Wilson, and it is known that the latter when a young man visited here on several occasions. The original owner and builder of the house was Judge Owen Thornton Reeves, and it is said to have been designed by a Baltimore architect. It stands on South Paint Street. Just south of this is the McLandburgh-Fullerton house (Fig. 2), which dates from 1846. This is said to have been designed by the same Baltimore architect, whose name is unknown. Since 1865 it has been owned and occupied by Mr. A. L. Fullerton, who is also the present owner of the Reeves-Woodrow house. The Fullerton home is also of the large, square, two-story brick type, but is without the high basement which is a characteristic of the former house. The face brick are of very fine quality and color, and are said to have been shipped from Baltimore and were packed between blankets to protect the edges. In this example also the Greek Ionic porch and the doorway are the chief ornamental features of the house.

One block farther south on the same street is the Atwood-Wilson house (Fig. 3). It was built by the original owner, Jacob S. Atwood, in 1845, who seems to have been a prominent builder in Chillicothe in the forties. It was probably designed by a Mr. Kelly, an architect of Columbus, Ohio, who is known to have been the architect of a number of the better structures of Chillicothe. This house is also of brick, but differs from the usual type in that all the exterior trim—the cornice, the columns, and entrance features—is of stone. The Greek Corinthian order used is that from the Tower of the Winds, Athens. Near by is the Bartlet-Ritchart-Cunningham house (Fig. 4). This is of the one-story temple type, of brick, with wood columns, pediment, and cornice. Here also the order is that of the Tower of the

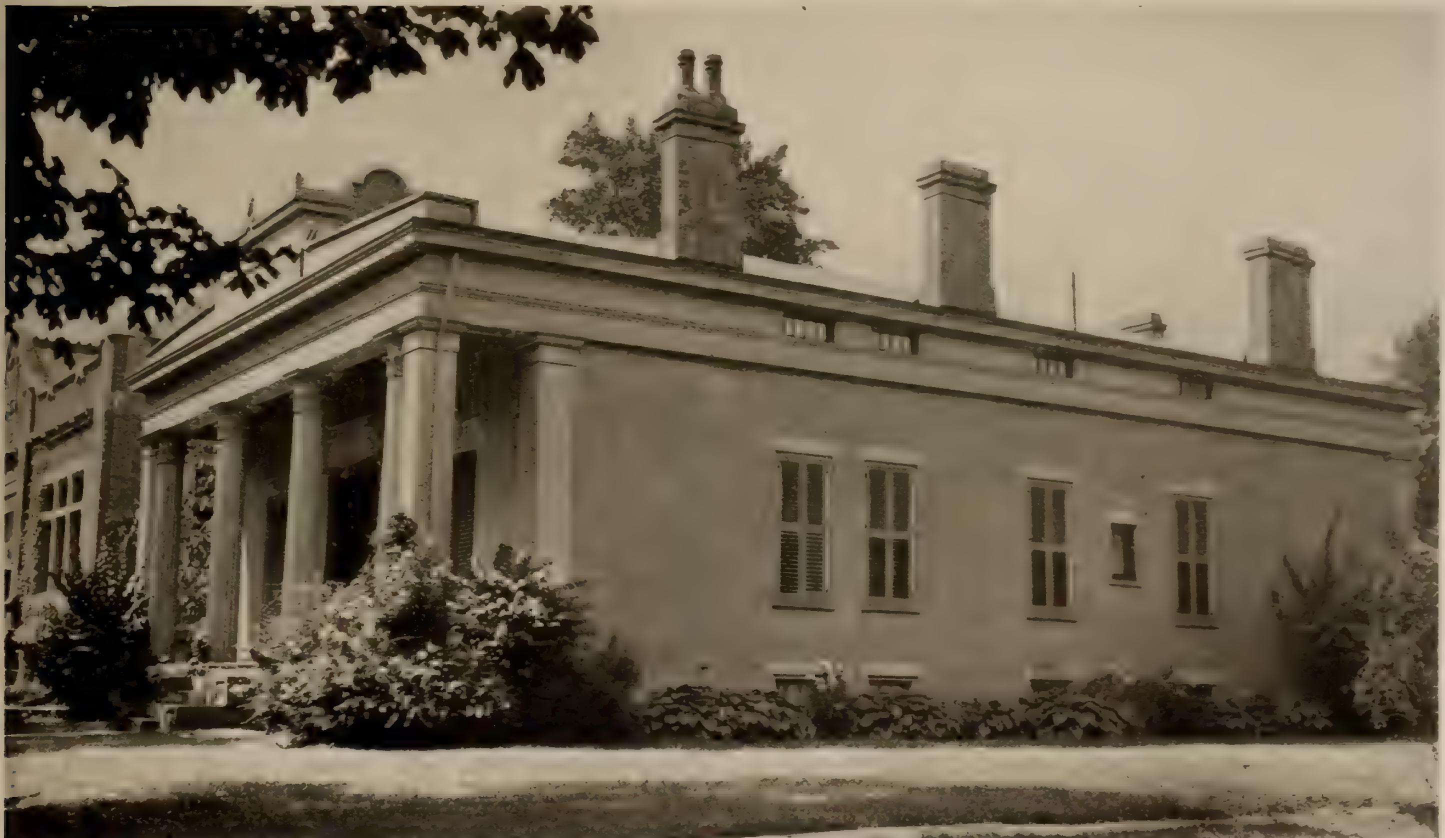


Fig. 4. THE BARTLET-RITCHART-CUNNINGHAM HOUSE, CHILLICOTHE, OHIO.

Winds, and is archæologically correct, because the column is used without a base. This house, also accredited to the architect Kelly, was built in 1850.

The finest architectural features of most of these old Greek revival houses are the doorways, which usually exhibit pure Greek forms. These entrances can be classified into two general types: those with the doorway protected by a small porch, supported usually by two columns, and those where the doorway is sheltered by recessing.

The entrance porch and doorway of the McLandburgh-Fullerton house (Fig. 5) is a good example of the first type. In this the Greek Ionic order is used both on the porch and as a part of the doorway, the whole treatment being very ornamental.

The porch and doorway of the Carlisle house (Fig. 6), located on East Main Street, is of the same type, but much simpler in design. In this case a modified Greek Doric order is used, but the treatment of the doorway is very plain. This house dates from 1840.

The side entrance of the Atwood-Wilson house (Fig. 7) is the third example of the porch type, and shows the use of the Greek Corinthian order, of the Tower of the Winds. The main entrance to this same house (Fig. 3) is of the second, or recessed, type; two columns placed in antis form the entrance to an exterior vestibule. The columns in this house are of stone, and are well executed.

The entrance doorways of the recessed type are of two varieties, the one-story and the two-story. The one just described is of the former type. A typical example of the two-story variety is that of the King-Fullerton-Brown house (Fig. 8), also located on East Main Street. This was built in 1837 by Edward King, a carpenter-architect, and is typical of the period when there was an attempt made to make this central portion of the front façade a dominant feature, and in the grandiose manner of the Greek revival. This consisted of a two-story recessed feature, with the main entrance below and a balcony above opening off from the second-floor hall. In this example the Grecian Ionic order has been used in superposition.

The Morris-Renwick house doorway (Fig. 9), on West Second Street, is typical of the modest yet dignified entrance of the period of 1840. The slight recess in the brick wall is filled with a simple wooden architrave, supported by two wooden columns of the severe Greek Doric type.

In the last illustration (Fig. 10) is shown the recessed doorway of the Watt-Safford house, on West Second Street. In this example the Greek character is only suggested, for the forms used are not Greek, but the simple lines and the proportions are in the spirit of Greek work. One of the chief criticisms brought against the builders of the revival period is that they were mere copyists of Greek forms. This example would indicate that this was not always true. In many cases these early builders and craftsmen were able to write into their buildings something of Greek refinement and spirit without the actual use of Greek forms.

When we consider these simple, refined, and dignified houses which have stood and served their purpose for over three quarters of a century and still retain their charm and usefulness, and contrast them with our many exotic creations inspired by Italian Renaissance villas, Spanish palaces, French châteaux, or English rural types, it becomes evident that we might, more appropriately, gain inspiration from these charming old houses of our early national period.

Efflorescence on Brickwork: Its Causes and Cure

By A. Redfern-Cornwell, A. R. I. B. A.

THE coating of white salts which frequently appears on the surface of brickwork, and which is called efflorescence, detracts considerably from the appearance of the brickwork, while the crystallization of the salts within the pores of the bricks tends to cause disintegration by action similar to that of frost. Furthermore, efflorescence may cause damp places on the brickwork so affected, destroying plaster and paint applied after the process has commenced.

I will first deal with the remedy in the case where the cause of efflorescence is due to the brick itself and its ingredients. In cases where efflorescence manifests itself in spite of all reasonable precautions, the first thing to do is to stop any means of water leakage into the brickwork, and, if the trouble is caused by the penetration of rain from the outside, the brick surface can be treated by the application of alternate washes of soap and alum solutions: the former in the proportion of 2.2 pounds of hard soap per gallon of water, and the latter in the proportion of 1 pound of alum per gallon of water. It is more economical and efficacious to employ aluminium sulphate ($Al_2\,3SO_4$) in the alum wash instead of common alum or potassium aluminium sulphate ($K_2Al_2\,4SO_4$). Where surface deposits are due to calcium sulphate, and therefore not washed off by the rain, they can be removed by scrubbing the face of the brick with hydrochloric acid diluted with about five times its volume of water. Care should be taken that before the acid is applied the brick surface should be thoroughly moistened and all traces of acid removed, after treatment, by washing the surface with water.

In the case of where brick clays are the cause through their containing magnesia, which is converted into sulphates in the process of being burnt, add one ounce of barium carbonate to every hundredweight of clay, thoroughly well mixed. The action is prevented, barium sulphate being formed, which is non-hygroscopic. Experiments should decide the exact amount to add by testing the results, as the proportion is governed by the percentage of salts contained in the clay, although the weights given will doubtless be found sufficient.

In the case of where the mortar is the cause of the efflorescence, it should be treated by mixing the mortar with some animal fatty matter in the proportion of 8 pounds or 12 pounds to 100 pounds of quicklime and 300 pounds cement powder.

To remove the efflorescence which has already made its appearance, the surface should be well brushed over in dry weather with a stiff broom, and the brushing repeated as it reappears until all salts have been removed.

There are cases where efflorescence is due to the extreme porosity of the brick, which readily absorbs moisture containing salts of magnesia of sodium. Oftentimes in new brickwork it makes its appearance, including the leaching out of certain lime compounds upon the surface. The remedy for the work already completed, provided the damp course is sound—is time alone.

As to the causes: Efflorescence is largely due to a large percentage of salts, which, during the burning of the clay, have been converted into sulphates. The effect of efflorescence is produced by what is termed saltpetring, and is first evident in new buildings, or even in older walls exposed to much damp.

The deposit is generally white, but is sometimes green or yellow, according to the composition of the clay used in brick manufacture. It is a sugar-like deposit of soluble salts carried by the moisture or water from the interior to the exterior of the bricks, and in time made manifest by crystallization or evaporation of the water or moisture.

Analysis shows that the composition of the crystals varies according to conditions.

These crystals consist of sulphates such as sodium sulphate (N_2SL_4), potassium sulphate (K_2SO_4), magnesium sulphate ($MgSO_4$), and calcium sulphate ($CaSO_4$).

In bricks made from clay found near the sea, chlorides are sometimes present, as potassium chloride (KCl) and sodium chloride ($NaCl$); while other clays furnish compounds, such as potassium carbonate (K_2CO_3), sodium carbonate (Na_2CO_3), sodium nitrate ($NaNO_3$), ferrous sulphate ($FeSO_4$), and aluminium sulphate ($Al_2 3SO_4$).

With the one exception of calcium sulphate, all the salts given above are soluble in water, most of them exceedingly so, as may be seen by the following table:

SALT	SOLUBILITY IN COLD WATER
Potassium sulphate	1 in 12
Potassium chloride	1 in 3
Potassium carbonate	1 in 1
Sodium sulphate	1.18 in 1
Sodium chloride	1 in 3
Sodium carbonate	1 in 2
Sodium nitrate	1 in 1
Calcium sulphate	1 in 500
Magnesium sulphate	1 in 3
Ferrous sulphate	1 in 2
Aluminium sulphate	1 in 2

Calcium sulphate, regardless of its relative insolubility, is the most fruitful cause of efflorescence, which is far less readily washed off by rain than that resulting from the more soluble salts.

The chief causes for the existence of efflorescent substances in bricks are due to one or more of the following conditions:

1. Soluble salts contained in the clay used.
2. Soluble salts formed while the clay is in the kiln —by the oxidation of minerals in the clay, or by the action of sulphurous kiln gases in the clay.
3. The use of clay tempering water containing soluble salts.
4. The introduction of soluble salts into the bricks after burning, generally from the mortar employed.

An undesirable variety of surface clay is that containing iron pyrites, or ferric desulphide (FeS_2)—as also clay which has been covered with sea water, for all these will exhibit a higher percentage of earthy salts.

Even in cases where the clay is of approved quality, foreign substances of deleterious character are sometimes introduced which result in the formation of salts giving rise to efflorescence. One example of such treatment is the use of ashes with the object of preventing shrinkage, and another is the adoption of sulphurous coal for burning.

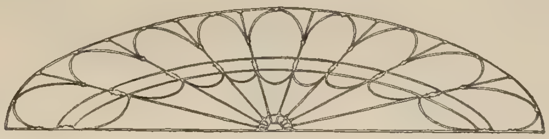
It occasionally happens that kiln-burnt bricks are impregnated with soluble salts, either in consequence of badly designed plant or inefficient management. Thus, after the dried bricks have been "crowded" into the kiln and the process of heating up has been commenced, if the fires are kept only just high enough to evaporate the moisture in proportion to the chimney draught, the process is unattended with prejudicial conditions.

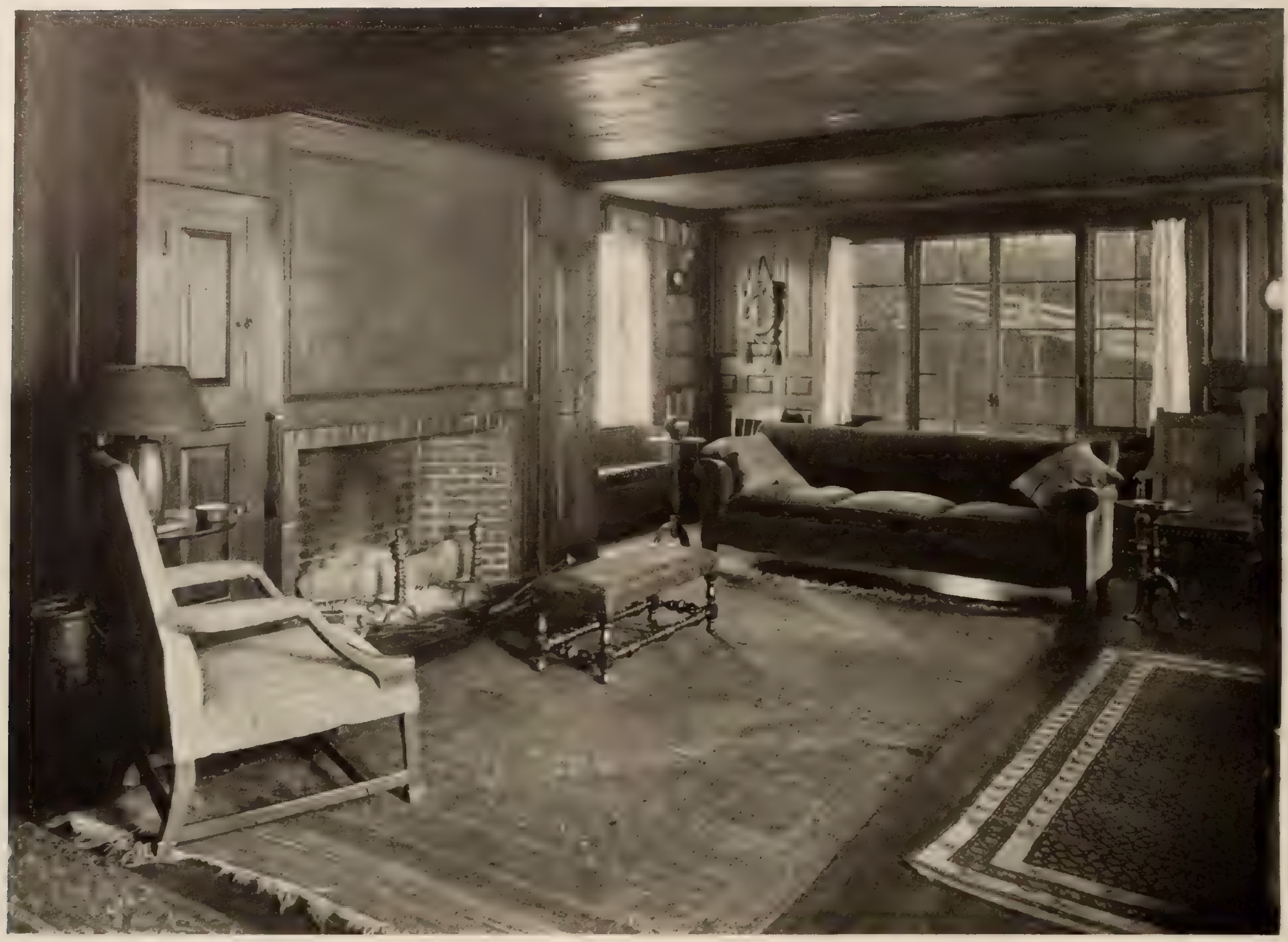
But if the moisture is evaporated too rapidly for the capacity of the shaft, the surplus vapor in contact with the bricks may absorb sulphur from the gases, resulting in the formation of sulphuric acid, which by combination with the carbonates and other salts will give rise to soluble sulphates, the most general cause of efflorescence. Where certain ingredients of the clay are calculated to give unsatisfactory results, various methods are adopted. The risk of efflorescence can be overcome in clays capable of being vitrified, thereby converting the salts into permanent silicates.

Clays containing earthy salts can be rendered harmless by washing, but in the case of low-priced bricks this method is too costly, and therefore impracticable.

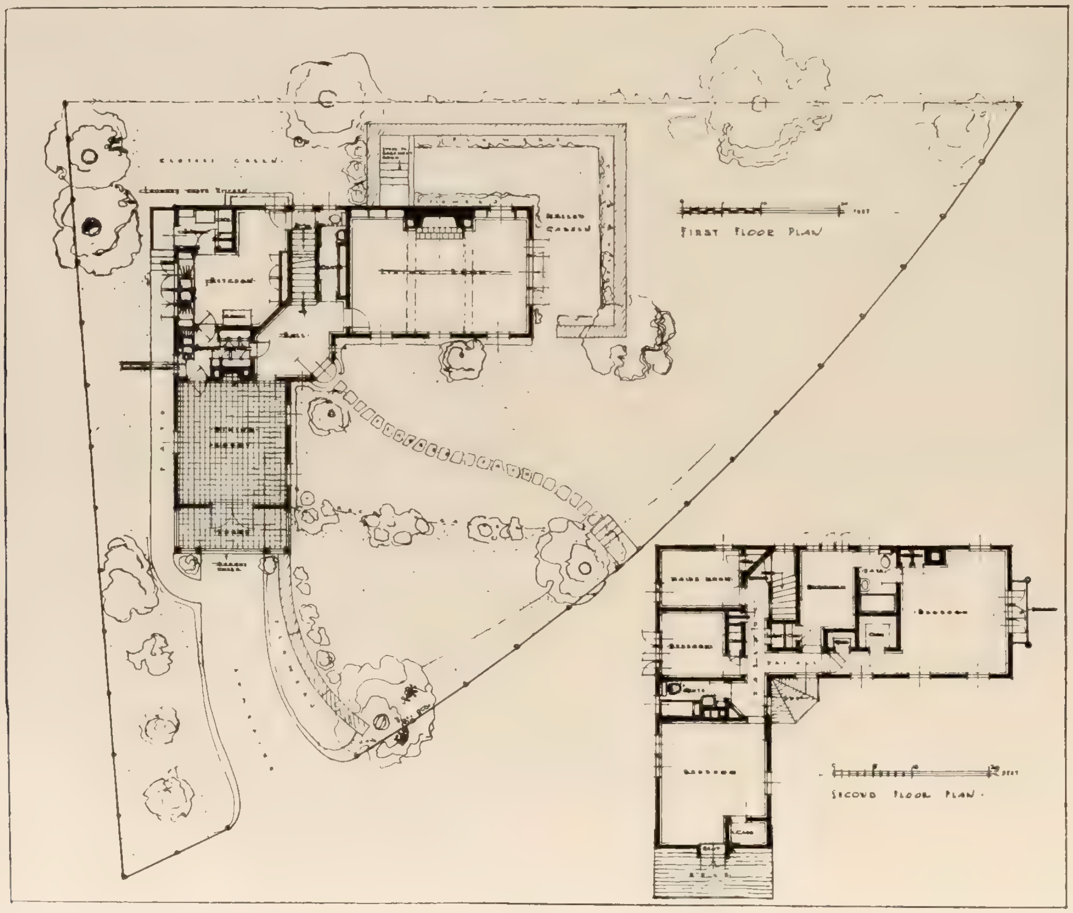
Chemical treatment is a more scientific expedient, performed in the case of clays prepared by the wet process by adding to the water used in the wash mill such chemicals as will react upon the soluble sulphates and precipitate harmless compounds, the chemicals most generally employed being barium chloride and carbonate, resulting in the precipitation of barium sulphate ($BaSO_4$), which is only soluble to the extent of one part in 400,000 parts of water by weight. Even if soluble sodium salts are present, they would simply be converted into carbonate or chloride by the corresponding barium compounds, and, being very soluble, these salts would be removed by rain quite readily if brought out by efflorescence on the surface of brickwork.

Examination and purification of the water used in brick-making are quite as necessary as treatment of the clay. The operation, being simple and very inexpensive, should never be neglected, as good clays are frequently contaminated by saline water.





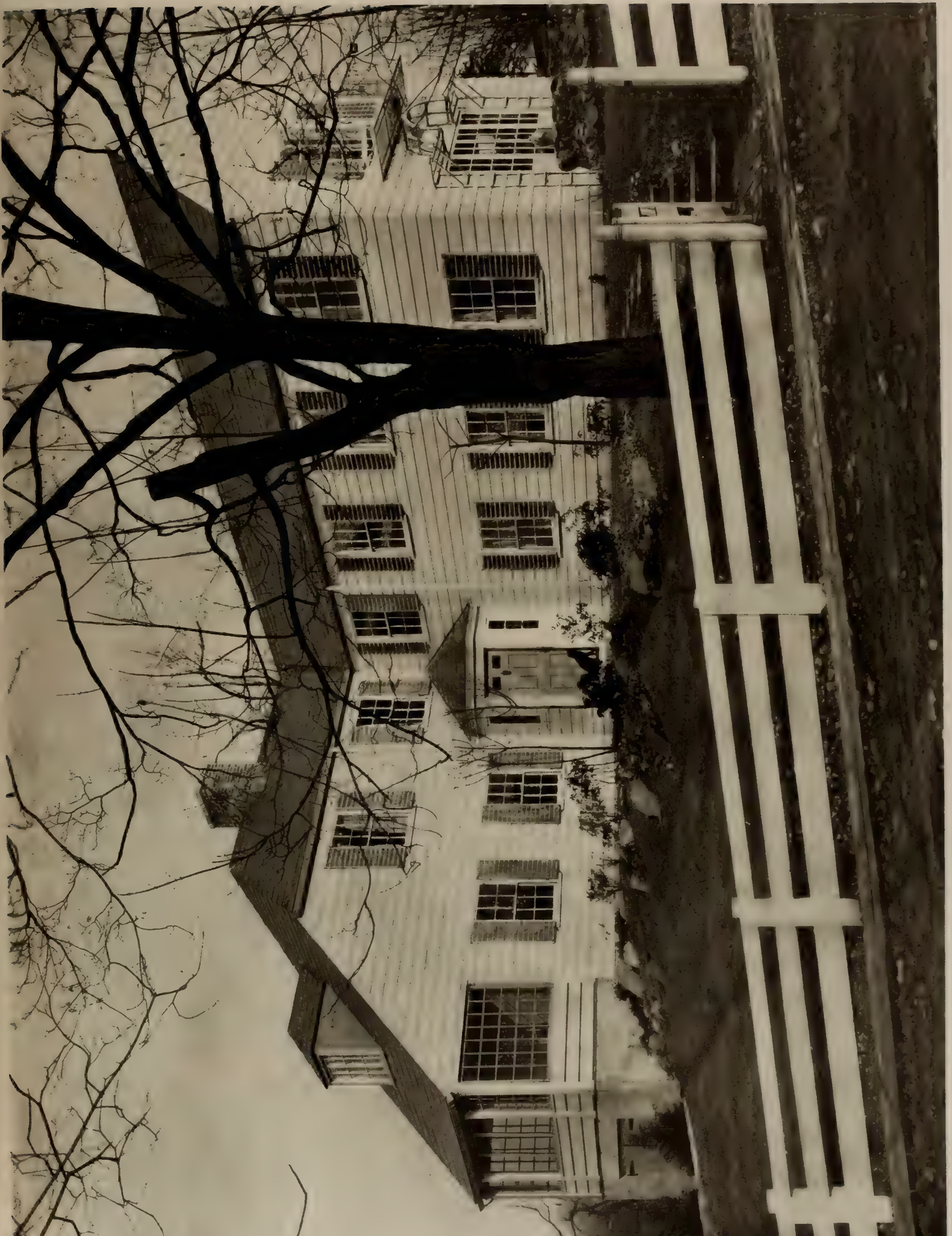
LIVING-ROOM.



FLOOR PLANS.

Strickland, Blodget & Law, Architects.

HOUSE, MRS. ALEXANDER F. LAW, BROOKLINE, MASS.



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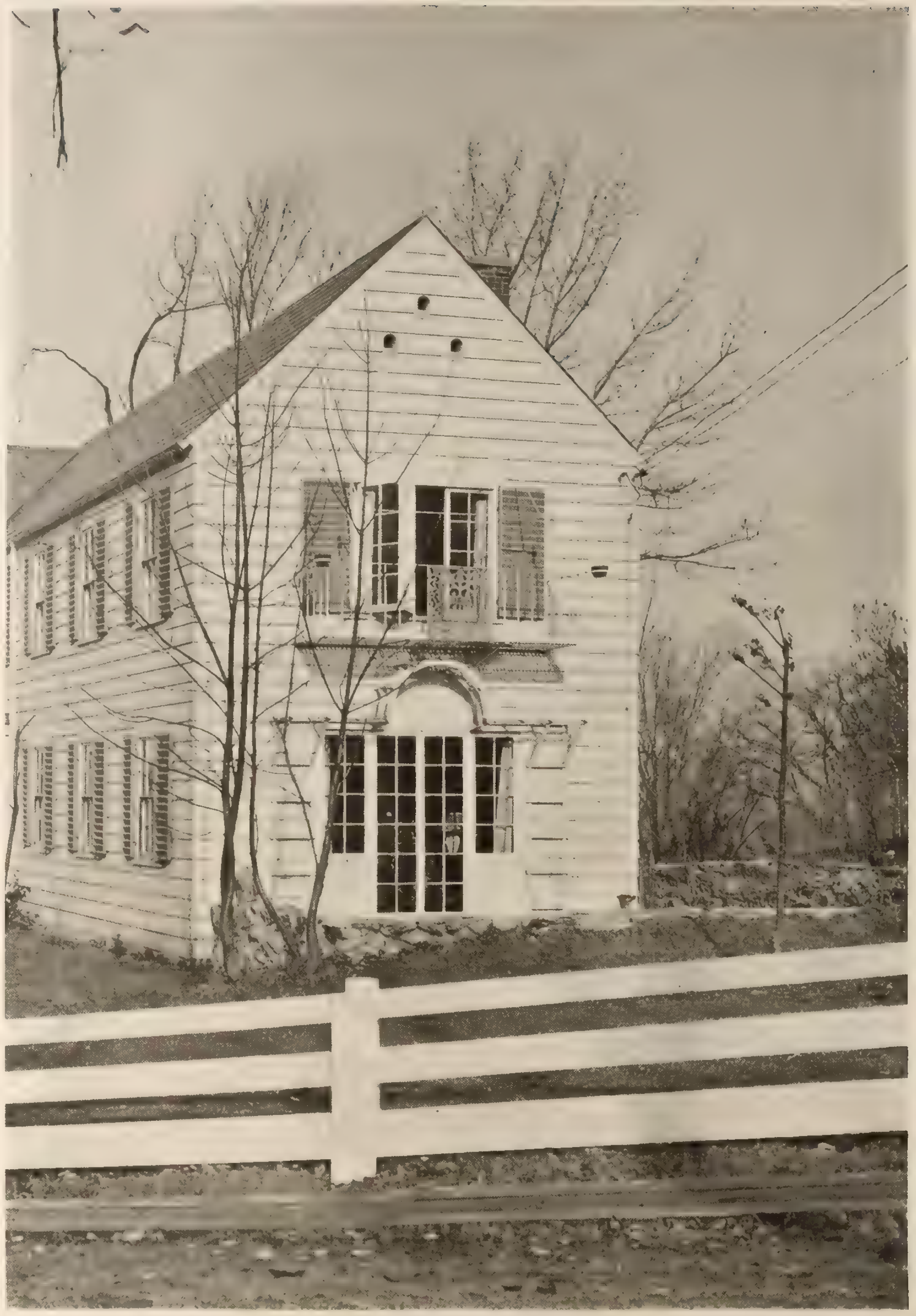
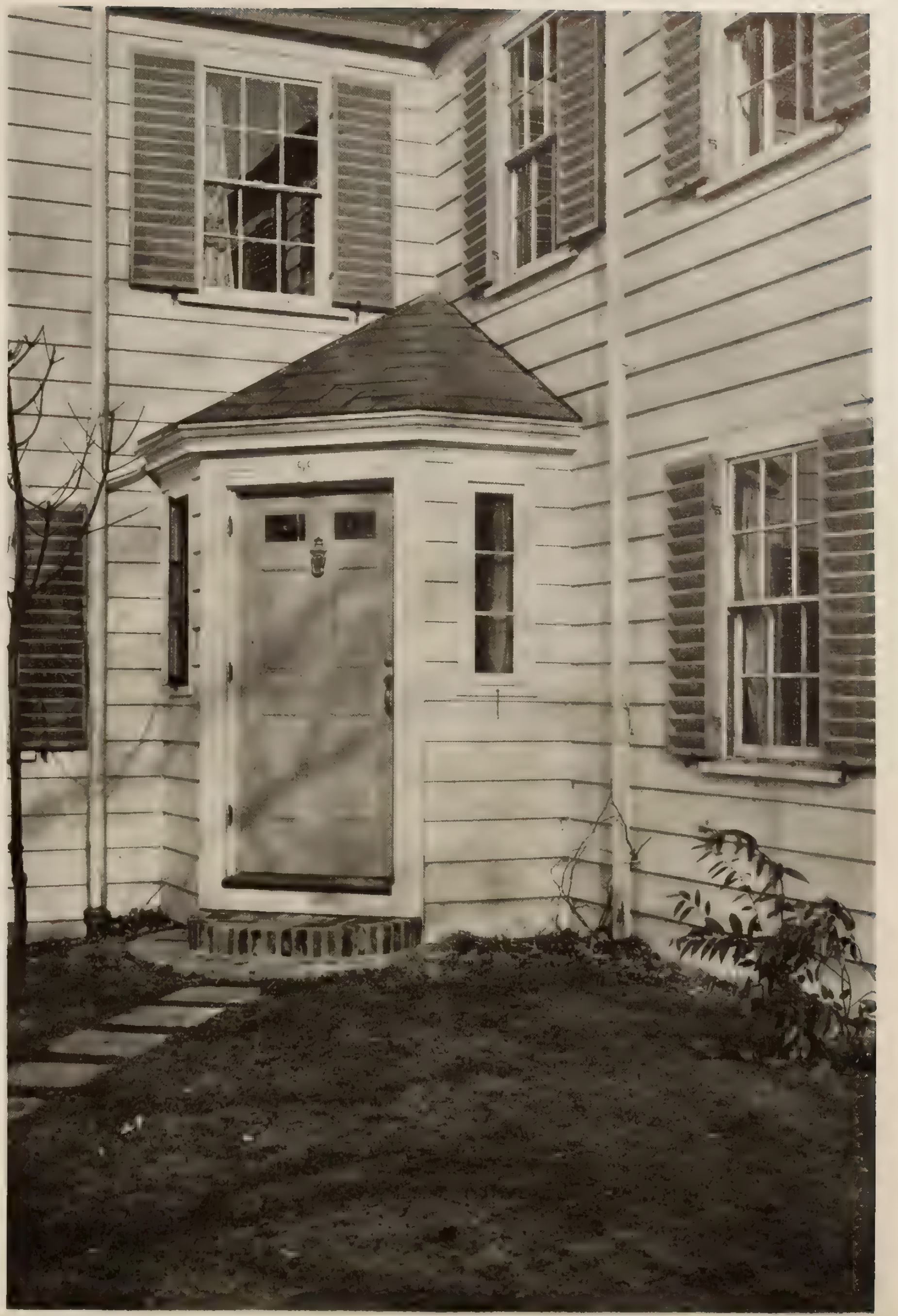


LIVING-ROOM WING.



ENTRANCE PORCH.

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Editorial and Other Comment

Our Architectural Schools

IN the old days it used to be thought quite necessary for the young man who wanted to be an artist or an architect—we mean to imply no invidious comparisons—to go to Paris and spend several years absorbing atmosphere and such things, in the Latin Quarter. So far as the painter is concerned, it is an exploded theory. A young man with talent and purpose can acquire a perfectly competent art schooling at home, save money, and, in many instances, save his self-respect, that is best conserved by an environment that demands a certain Anglo-Saxon regard for the conventions. Too many youngsters go to Paris to have fun. They substitute "atmosphere" for hard work, and are apt to come home disillusioned and in a mood to look down upon about everything that stands for wholesome and traditional art. We recall the attitude of one of our brilliant young illustrators who went over for a few years. His return was signalized by a contemptuous attitude toward all American art, and it took him several years to come down to earth and admit that the best thing he learned over there was to realize the opportunity offered to find his real inspiration in his own country. He has found it and has made a distinguished place for himself, not to speak of very satisfactory financial returns. The young architectural student has before him schools of the highest quality and equipment. They are to be found all over the country. Mr. George C. Nimmons, in his report of the Committee on Education of the American Institute of Architects, says:

"As to the education of the architect, I wish to say that the profession to-day is very fortunate in having the finest and best-equipped and most efficient schools of architecture that we have ever had in this country. I believe it would be of interest some time to tell the practising architects exactly how a young architect of to-day is educated and trained to practise his profession. I think most of you would be astonished to know and to see that we are preparing this country to educate an architect to practise in an art, in a manner even superior to that which is given at the Beaux Arts in Paris. That is, I mean to say that the education and training of an architect whose practice is in America is better adapted to his work than the education offered in Paris.

"The reason for that is that our schools not only teach design, which is the outstanding thing, of course, in a manner similar to the way they do over there, but we give, in addition to that, a vast amount of instruction and training in things which a student does not get in Paris. I mean we give a student here a general education and instruction and training in the things he needs in this country particularly, that he couldn't get there, and so the result is that most of our boys now go to our own schools of architecture.

"There are eighteen accredited schools. An accredited school means that the school of architecture has come up to a certain standard—a high standard of excellence—and is therefore approved and accredited by the association as a collegiate school of architecture, and that means that wherever a boy goes, and whatever part of the country he goes to, if he attends one of these eighteen schools he is assured of getting the finest and best education."

Now and then we are impressed by the fact that the best architectural school possible for some young men is to get into an established office and work up, doing any and every old thing that offers. Here and there the born architect is developed. It was so with Bertram Grosvenor Goodhue, as we may learn in the recently published book about the man and his work. He had little schooling in the ordinary ways, but he had genius that knew no obstacles, talent beyond the average measure, that grew apace with the opportunity to manifest it. There are many leaders in the profession to-day who will gladly admit that they owe their success to the inspiration and hard work that came from breaking into some famous office. An old story in art or literature, law, medicine, engineering; and our magnates of business may be counted by thousands who began on the basement stairs of some obscure shop, and climbed to the top of a modern skyscraper with "it is all mine" plainly written above the bronze doors.

"*Maximum Sardine Capacity*"

WE owe the heading to *Lutheran Church Art.* In that ably edited little publication there is an article on building costs that contains some salutary information for many optimistic congregations and designers of churches. Building churches, like everything else, has become a matter for counting the cost. The writer, to whom we are indebted for the information, says that "we believe that the cost of church building is at least 120 per cent higher to-day than it was ten years ago. The cost per seated person in a very simple brick church without tower or basement will be close to $140. A basement will add from one-fifth to one-fourth the cost of an average church. A tower means a similar cost.

"Printed reports of church dedications are often misleading. 'Our new church seats 700 persons, and cost $70,000,' read one report. We took the next train to that city, to see how it had been done. But when we pulled out our trusty six-foot rule, the 700 sittings suddenly shrunk to just half that number! Instead of costing $100 per person seated, that church really cost close to $200 per person seated. The whole trouble was that they counted their dedication-day crowd, when there were folding chairs in every aisle, in front, in the rear, in the gallery, and people wedged into every step of the two gallery stairways.

"Reports of church dedications are invariably optimistic. Maximum sardine capacity is counted, and the results done into print. This fact ought to be kept in mind, in estimating the cost of the church on the cost-per-person-seated basis. Congregations ought not to jump at the conclusion that they can build a church for $100 per person seated."

Average Building Costs per Square Foot

THE index of building costs compiled by the Federal Reserve Bank of New York indicates that the average expense of building this year has been slightly higher than a year ago, while the cost index of the *Engineering News-Record* reflects a decline of more than 5 per cent. The marked disparity between these two indexes is probably due to the varying importance assigned to the different materials entering into the averages. The index of the Federal Reserve Bank is based on the wholesale price index of building materials published by the Department of Labor, which gives great weight to the price of lumber, and very little to the price of structural steel. On the other hand, this index is considerably more inclusive than the other, which is based on prices of only a few of the most important materials. The two indexes ascribe about the same importance to the cost of labor—approximately 40 per cent of the total.

Some light is thrown on the question of comparative costs by a consideration of the area and value represented by contracts awarded. The average value per square foot of floor space during the first five months of this year, and the corresponding period last year, by classes of building, is as follows:

CLASSIFICATION	1925	1924
Commercial	$5.39	$5.17
Educational	6.51	5.77
Hospitals and Institutions	7.92	6.83
Industrial	6.91	6.78
Military and Naval	5.78	6.60
Public Buildings	7.65	6.85
Religious and Memorial	8.63	7.44
Residential	4.87	4.58
Social and Recreational	8.22	5.62
Average	$5.47	$5.06

It will be noted that the average cost per unit of area is materially higher this year in every group except military and naval buildings, which form only a very small proportion of the total. The average increase in unit cost is about 8 per cent. This rise does not by any means measure the advance in average building costs during the year; but it does provide some basis for the contention that an advance rather than a decline, for the country as a whole, has taken place.

The Penalty of Poor Design and Bad Construction

DOCTOR BAILEY WILLIS, professor emeritus of geology, Stanford University, and president of the Seismological Society of America, was among the first to make a survey of the damage at Santa Barbara.

His outstanding comment on the situation was that a dominant reason for much of the destruction was "poor design and bad construction."

Doctor Willis further said: "The responsibility really comes back to technical men and *public opinion.* If the engineers and architects had insisted on adequate building laws, embodied in a proper code of regulations, and if public opinion had supported the officials in a rigid enforcement of the rules of good construction, this moderately severe earthquake would have passed simply as an interesting experience."

The study of earthquakes is in its infancy; one thing definitely known about them is that you can never tell where they will shake next. Science has pretty well established the fact that in many ways our planet is still in the process of making. Changes constantly taking place in the interior necessitate compensating adjustments of the surface. Frequently these are violent, as people of Japan and sections of the Pacific Coast both in North and South America can well testify. In 1923 and 1924 alone earthquake shocks were felt in the United States in Oregon, January 6; Seattle, April 25; Walla Walla, Wash., January 27; Winchester, Va., January 1; Hendersonville and Saluda, N. C., October 18, 1923; Cairo, Ill., and Paducah, Ky., April 2, 1923; Memphis, Tenn., Springfield, Ill., Owensboro, Ky., in the latter part of 1923, and in many parts of Maine on September 30, 1924. They are so frequent on the Pacific Coast as to cause little comment when no damage results.

In the Santa Barbara earthquake many buildings were totally destroyed. All types of construction seem to have suffered varying degrees of damage. As was the case in Japan, buildings which expressed the most modern practice in engineering design and workmanship, thus resulting in structures that were practically a monolith, gave the best account of themselves. In Japan some such structures went through without the slightest injury. Structural engineers who made inspections took home lessons which pointed the way to prevent failure in the future, namely, proper design and competent workmanship.

There is no need to claim that we can build every time 100 per cent proof against the devastating forces of nature. Experience has proved, however, that we can defeat their attacks to the extent of a 75 per cent victory at least, which is a salvage and a protective value worth attaining.

It is also just as well to remember that if buildings can be built to withstand earthquake they will certainly withstand fire and tornado, two additional and altogether too frequent destructive elements.

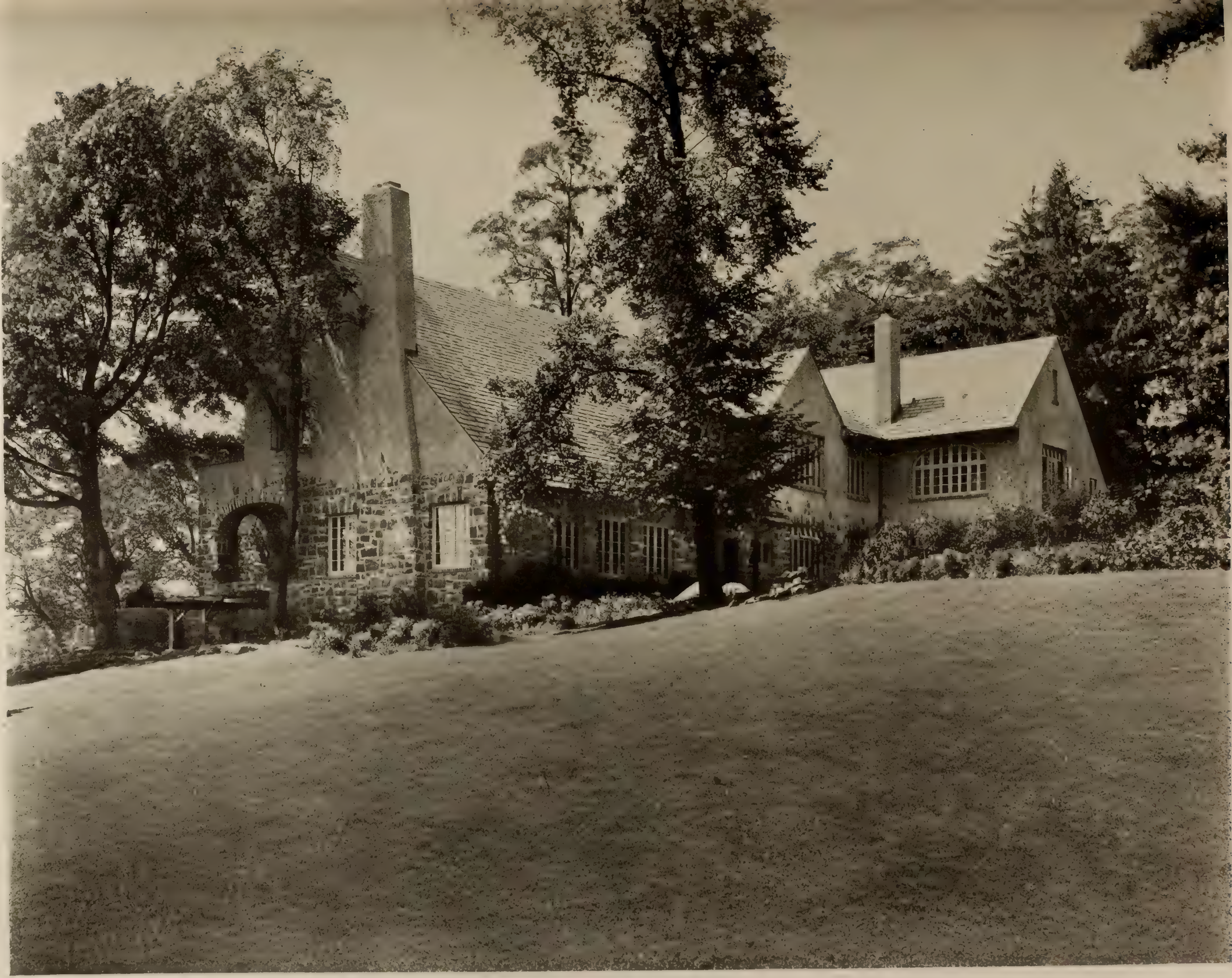
Production of Building Stone

PRODUCTION of stone in the United States in 1924, exclusive of stone manufactured into lime, cement, and abrasive materials, or crushed into sand, amounted to more than 102,366,000 short tons, valued at about $160,000,000, according to a preliminary compilation of reports from producers made by the Bureau of Mines, Department of Commerce. The figures indicate a reduction of about one per cent from the 1923 production figure of 103,327,460 short tons. The value of the 1924 production is practically the same as the 1923 figures, $159,947,241. Final figures for 1924 production may be somewhat greater than the preliminary figures.

Stone sold as building stone, curbing, flagstone, and crushed stone increased in quantity, and stone sold as monumental stone, paving blocks, flux, and refractories decreased. The total of stone sold for rubble, riprap, manufacturing industries, and miscellaneous uses is estimated as slightly less than in 1923.

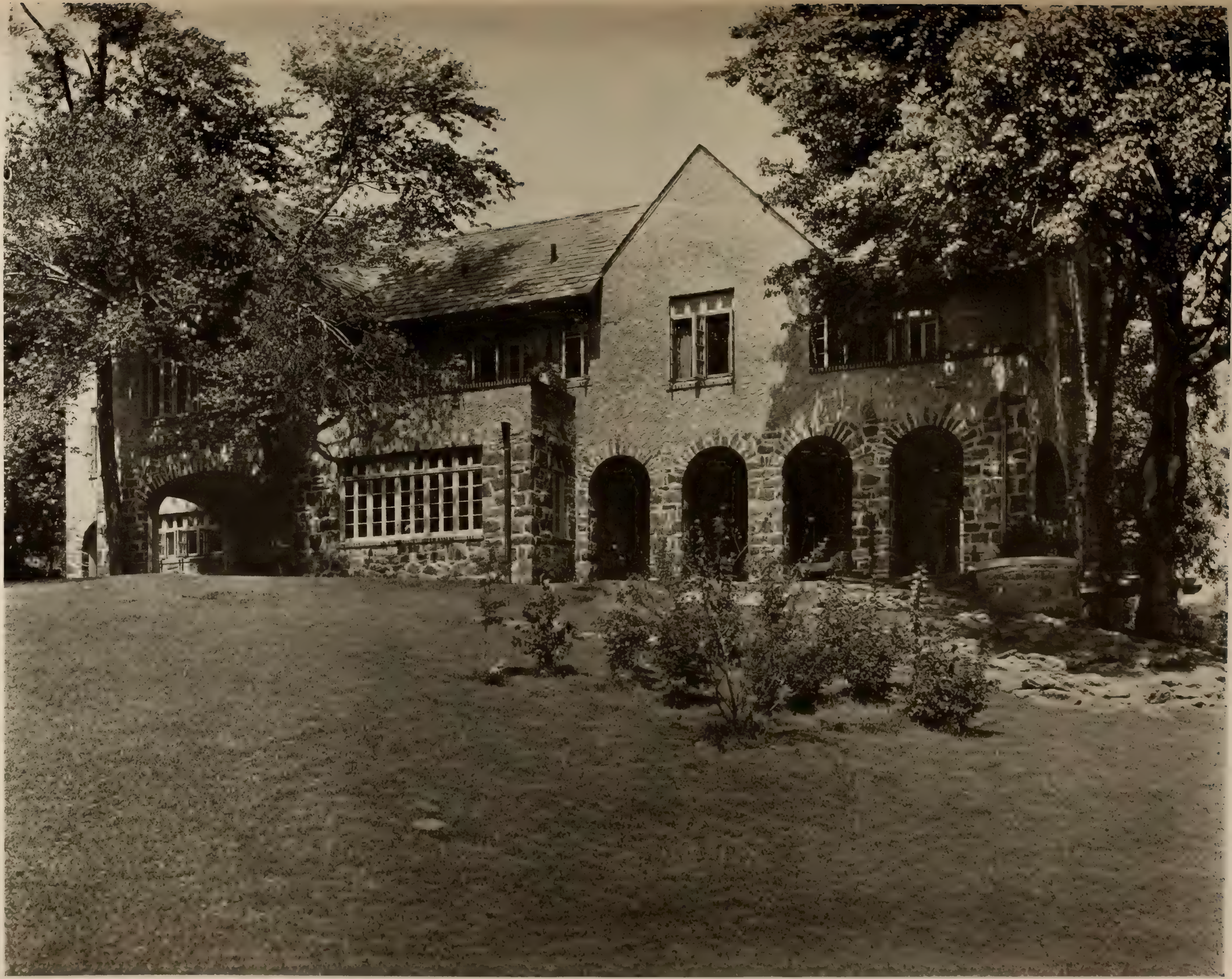
The United States to Have Their Own Embassy and Consulate Buildings in Japan

H. VAN BUREN MAGONIGLE and Antonin Rayond have been appointed architects for the new Embassy and Consulate buildings to be built in Tokio. Mr. Magonigle will sail in October for a preliminary survey of conditions. His great Kansas City Memorial is nearing completion.

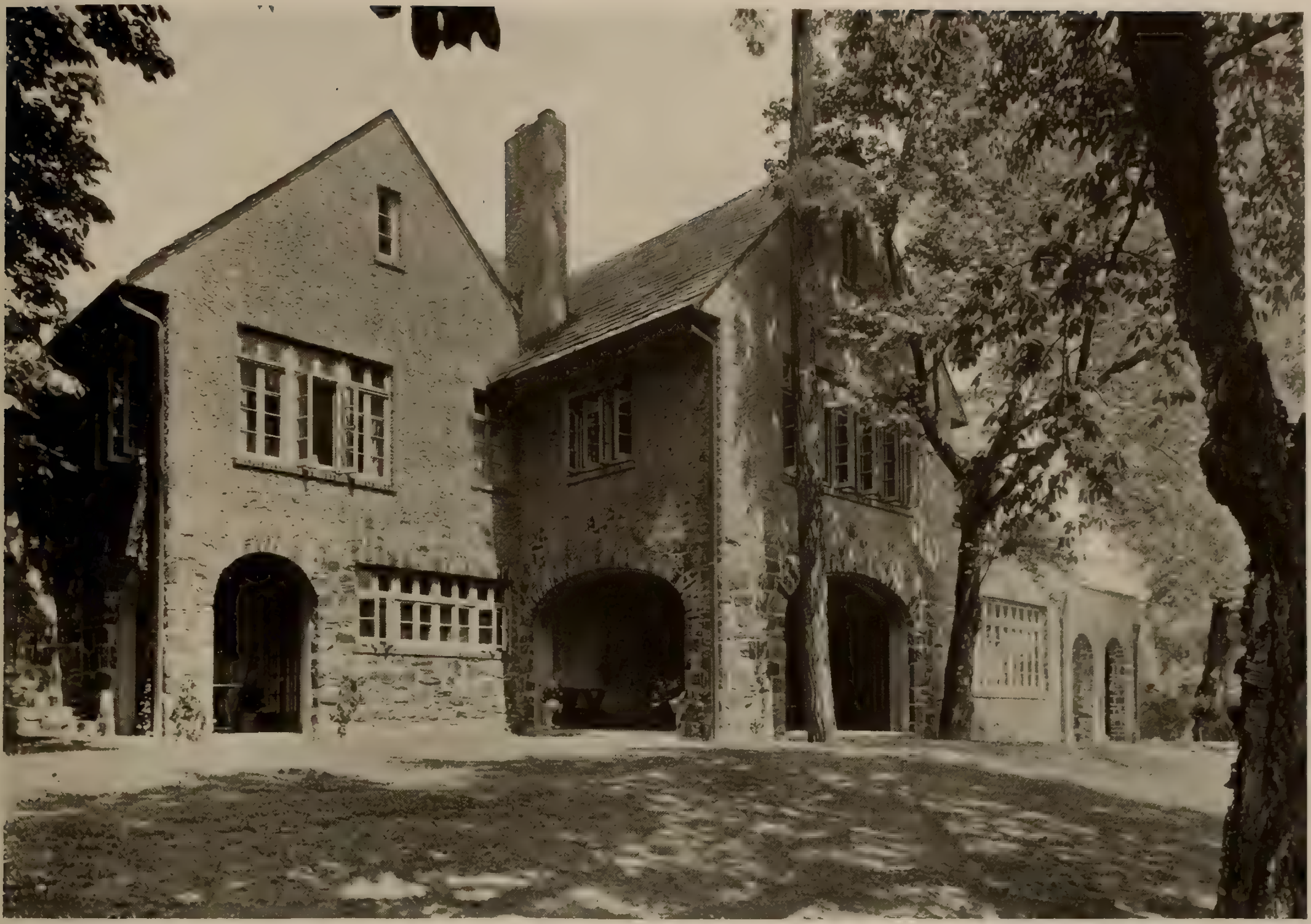


NORTH FAÇADE, RESIDENCE, J. M. HUBER, LOCUST, N. J.

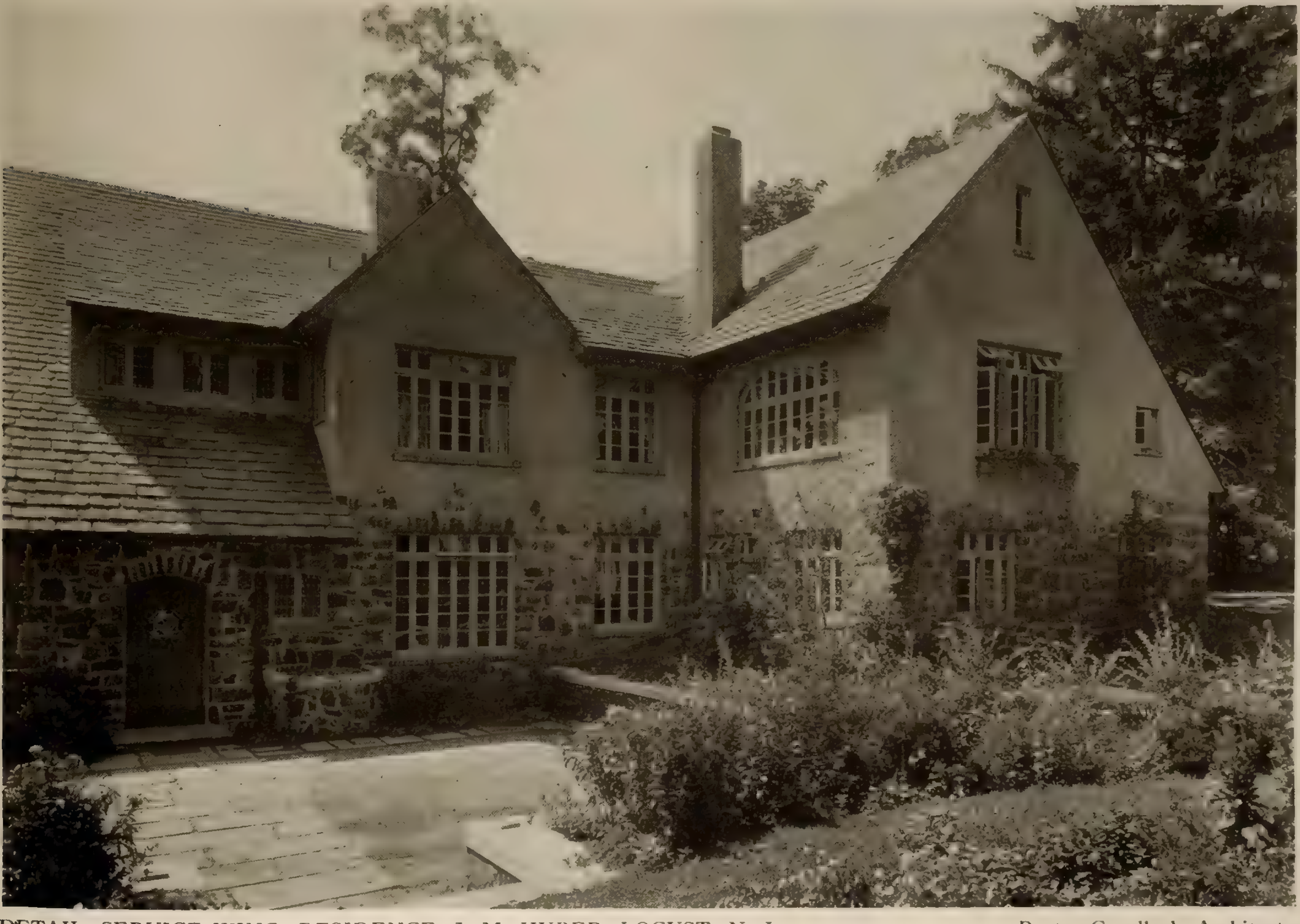
Brutus Gundlach, Architect.



SOUTH FAÇADE, RESIDENCE, J. M. HUBER, LOCUST, N. J. Brutus Gundlach, Architect.

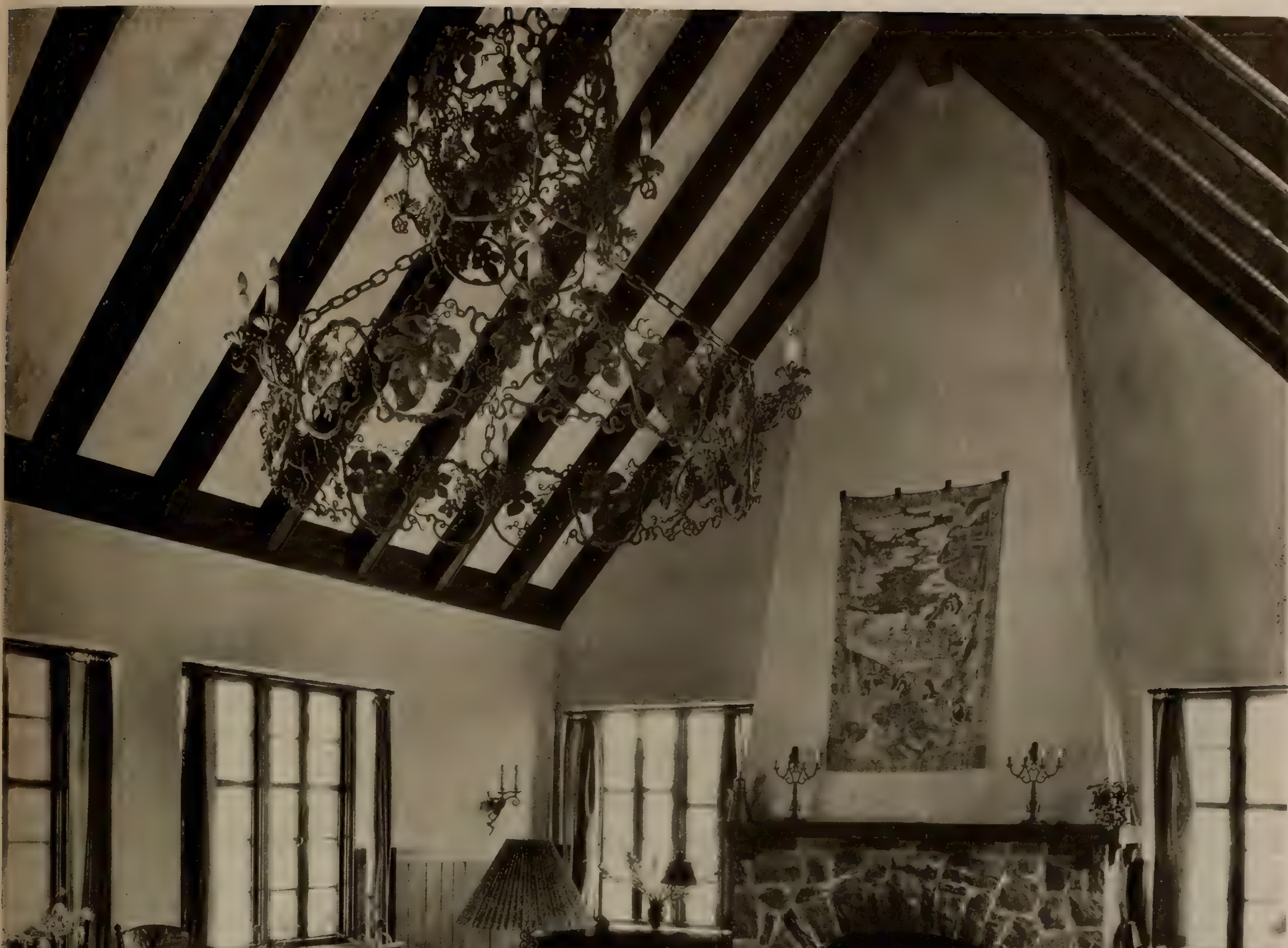


SERVICE WING.



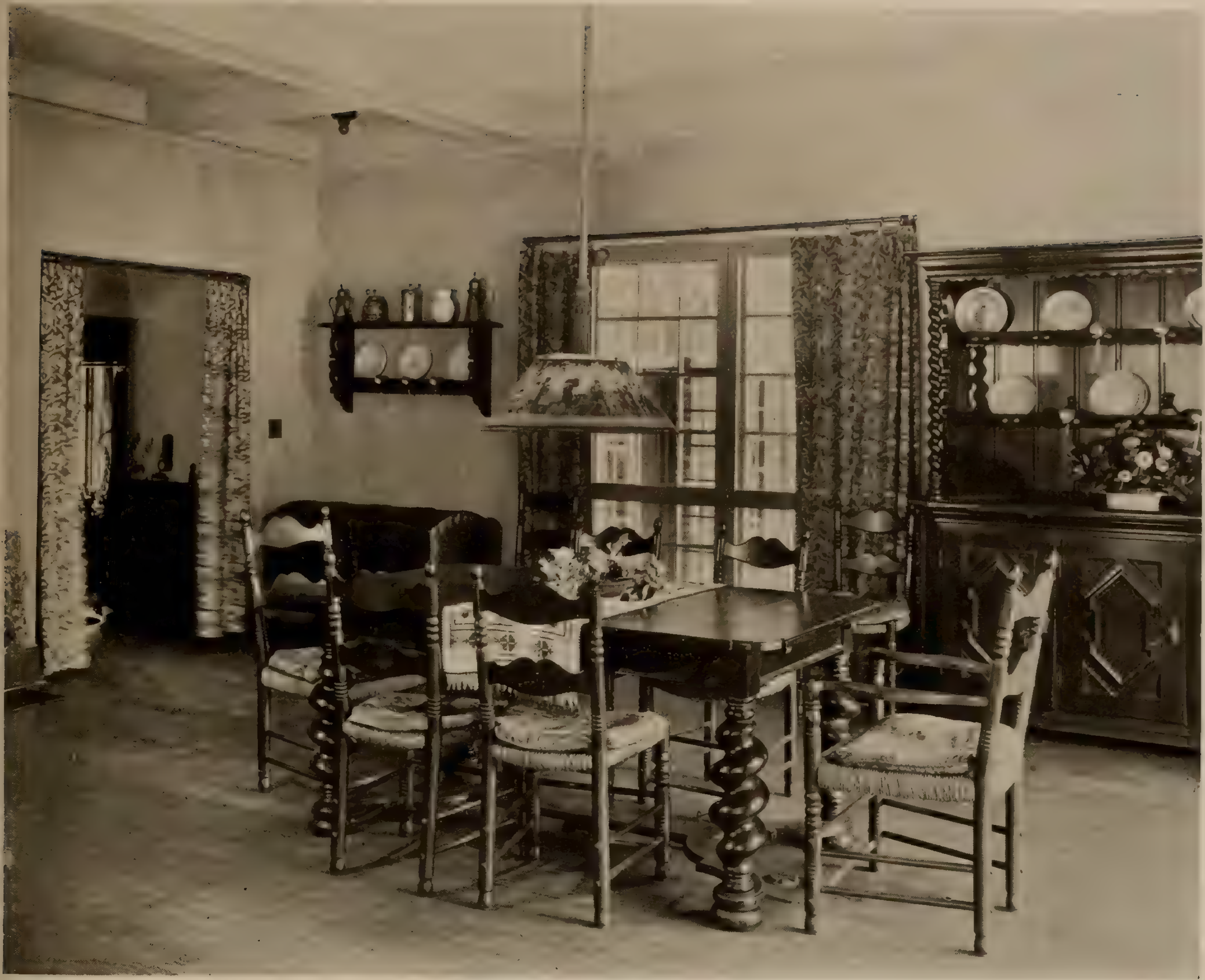
DETAIL, SERVICE WING, RESIDENCE, J. M. HUBER, LOCUST, N. J.

Brutus Gundlach, Architect.

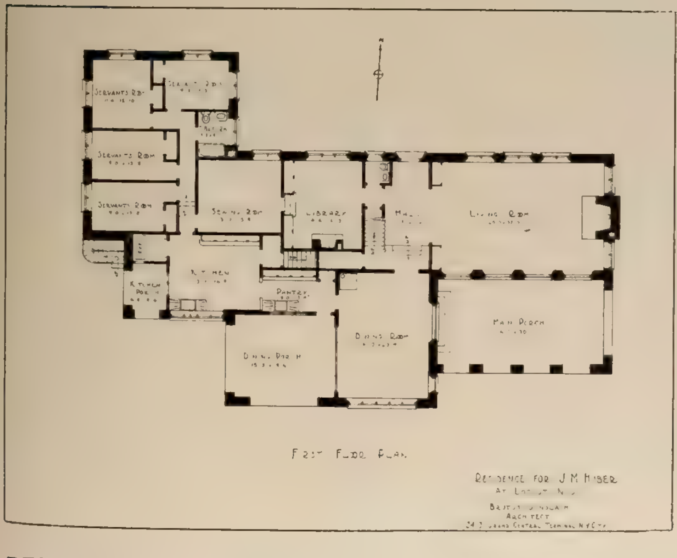


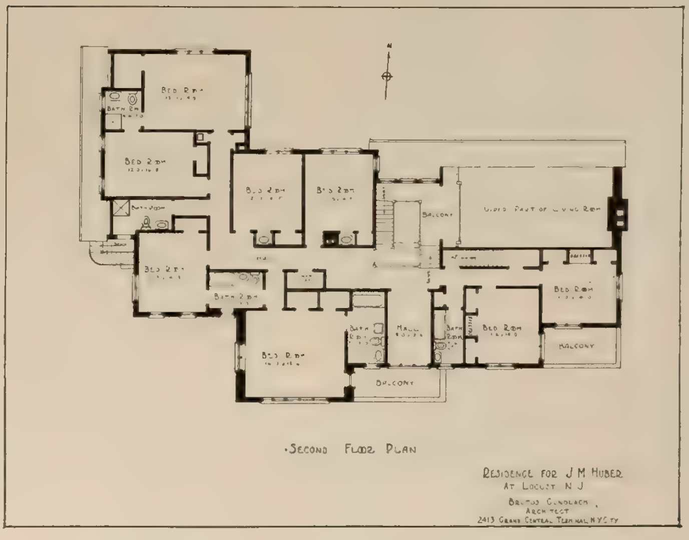
LIVING-ROOM, RESIDENCE, J. M. HUBER, LOCUST, N. J.

Brutus Gundlach, Architect.



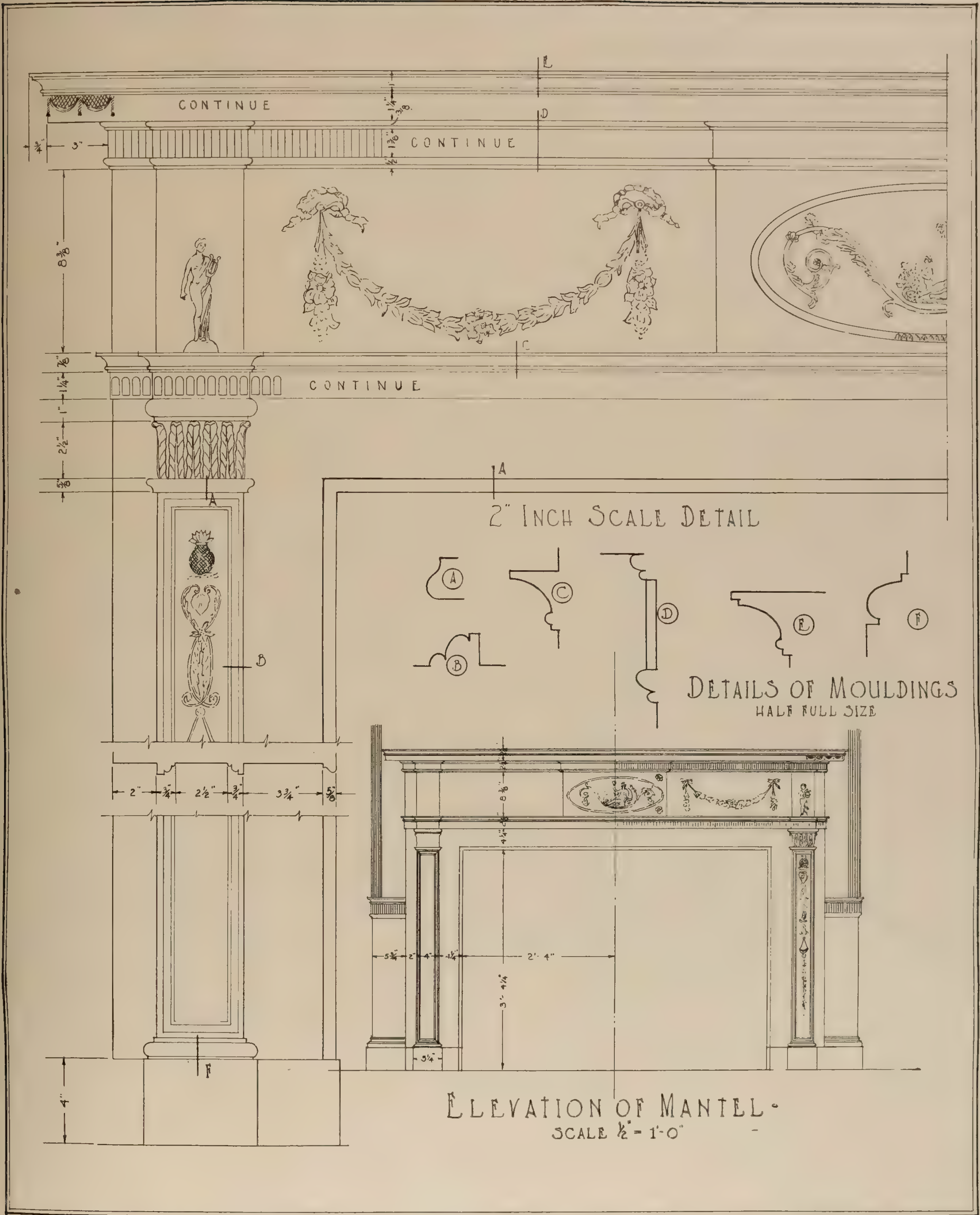
DINING-ROOM.





RESIDENCE, J. M. HUBER, LOCUST, N. J.

Brutus Gundlach, Architect.



2" INCH SCALE DETAIL

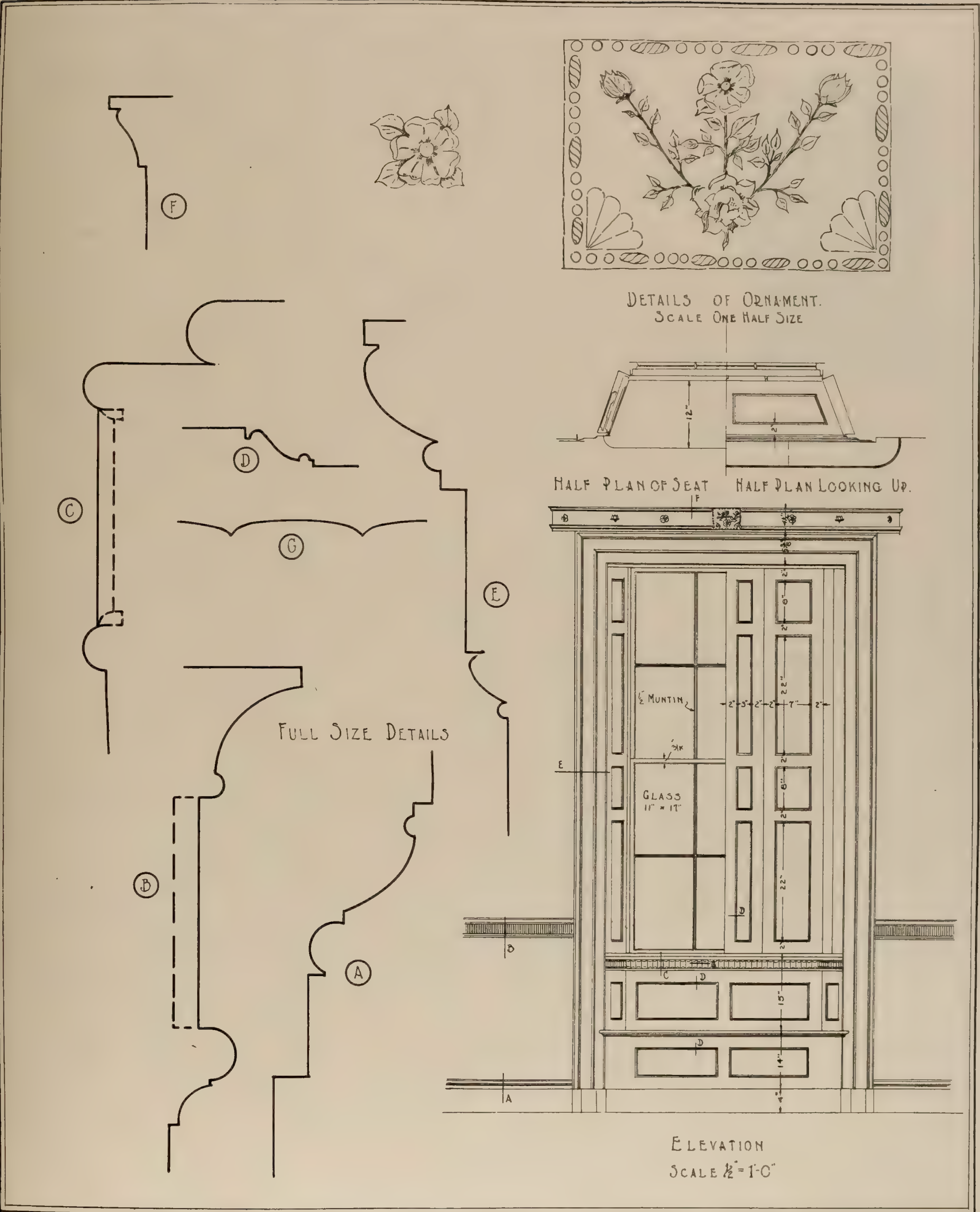
DETAILS OF MOULDINGS
HALF FULL SIZE

ELEVATION OF MANTEL
SCALE ½" = 1'-0"

MAINE
COLONIAL
SERIES

MANTEL *of the* GEN. McLELLAN HOVSE
TOPSHAM MAINE
BUILT IN 1793

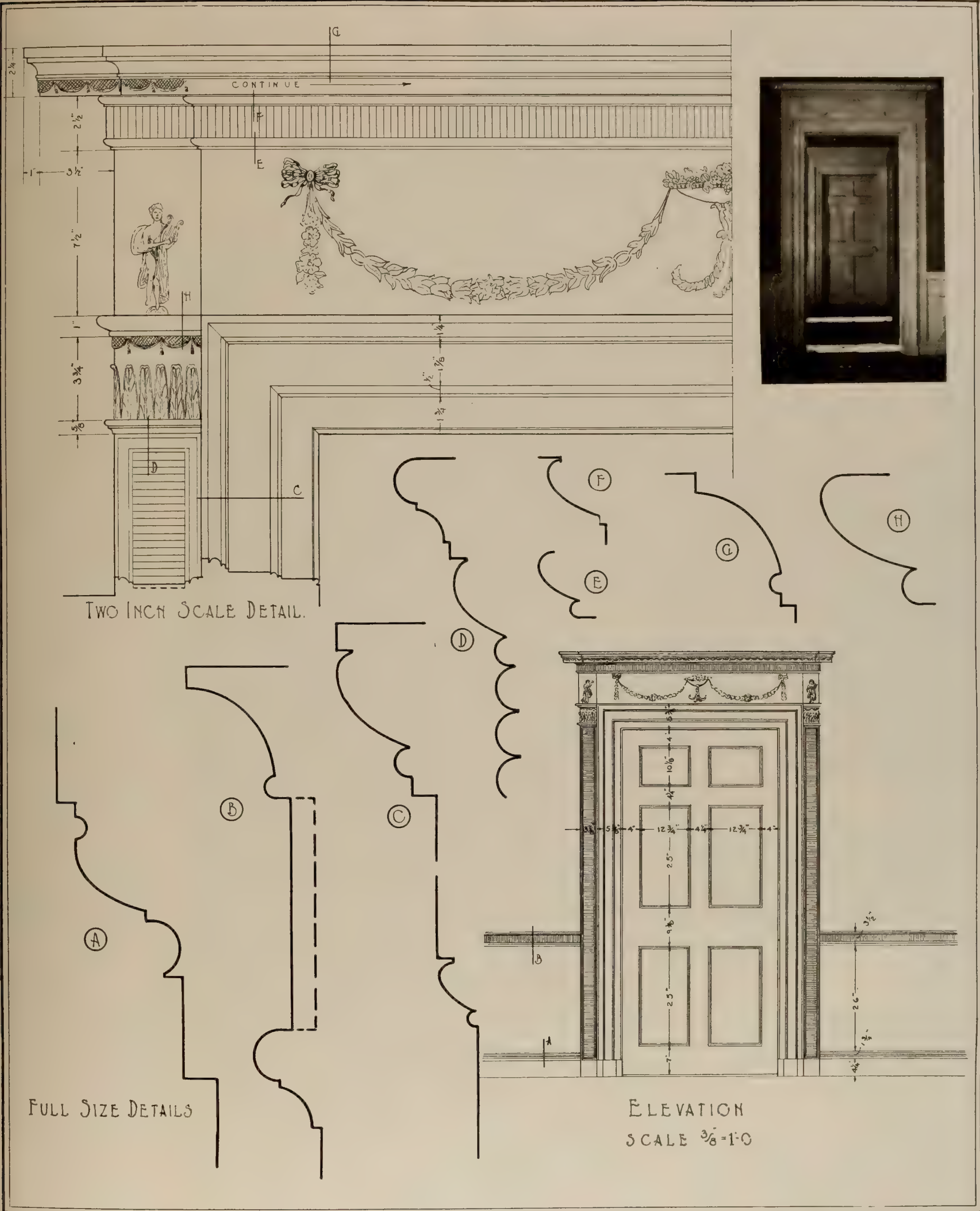
MEASURED AND
DRAWN BY
A. J. HARRIMAN.



MAINE
COLONIAL
SERIES

WINDOW of the GEN. Mc LELLAN HOVSE
TOPSHAM BUILT IN 1793 MAINE

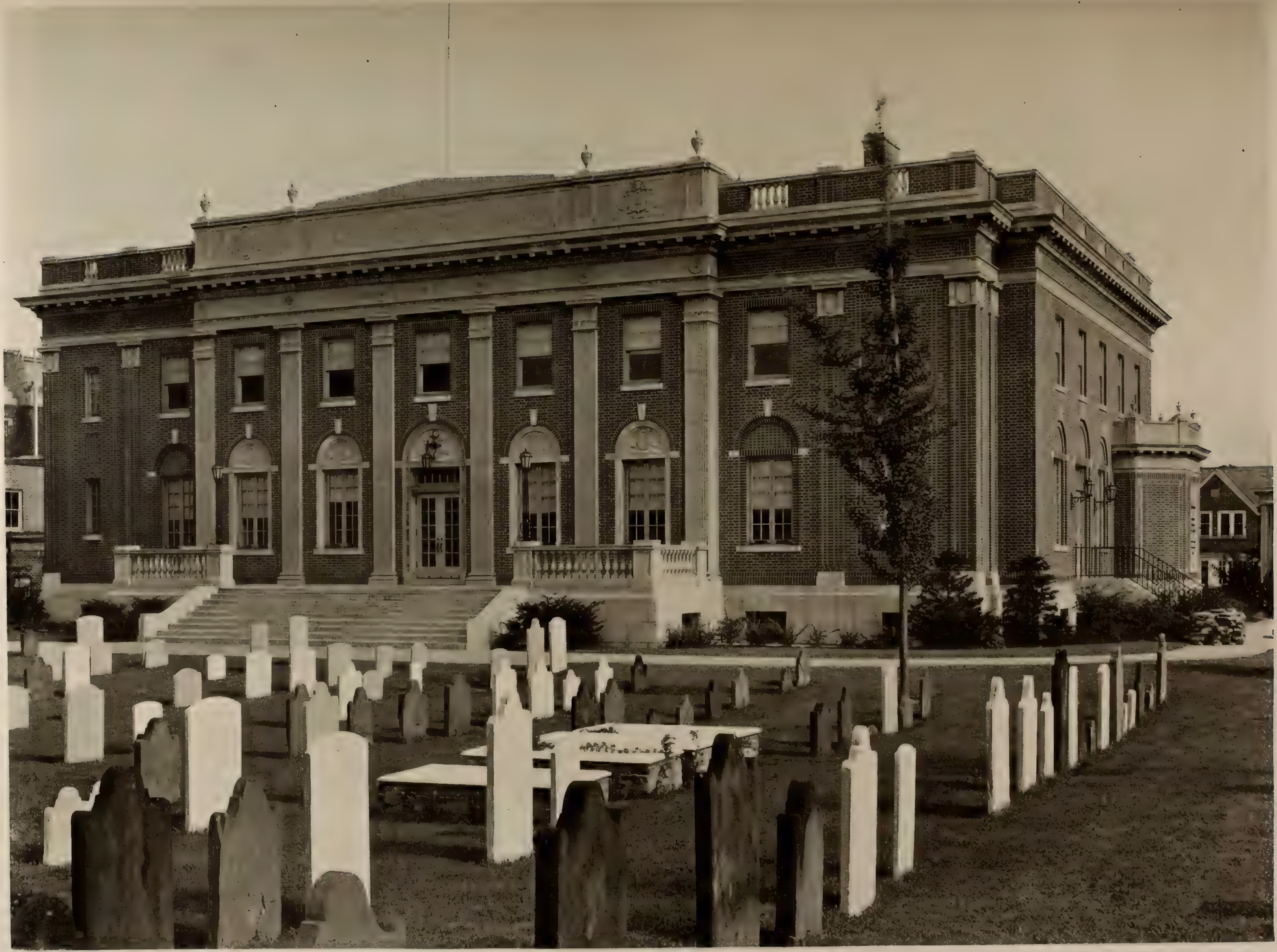
MEASURED AND
DRAWN BY
A. J. HARRIMAN.



MAINE COLONIAL SERIES

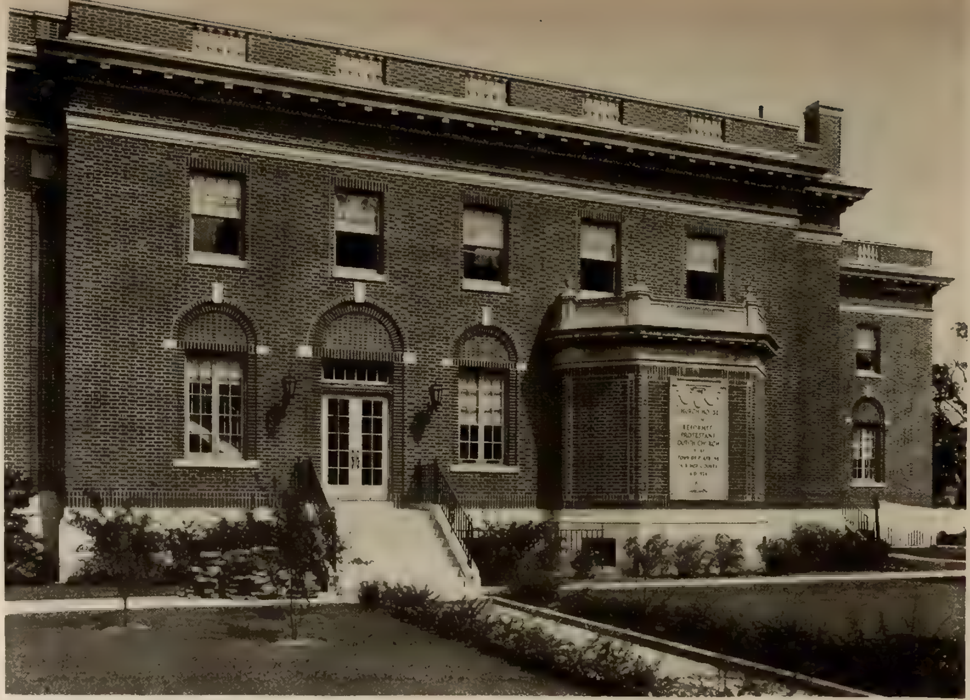
DOORWAY of the GEN. Mc LELLAN HOVSE
TOPSHAM MAINE
BUILT IN 1793

MEASURED AND DRAWN BY A. J. HARRIMAN.

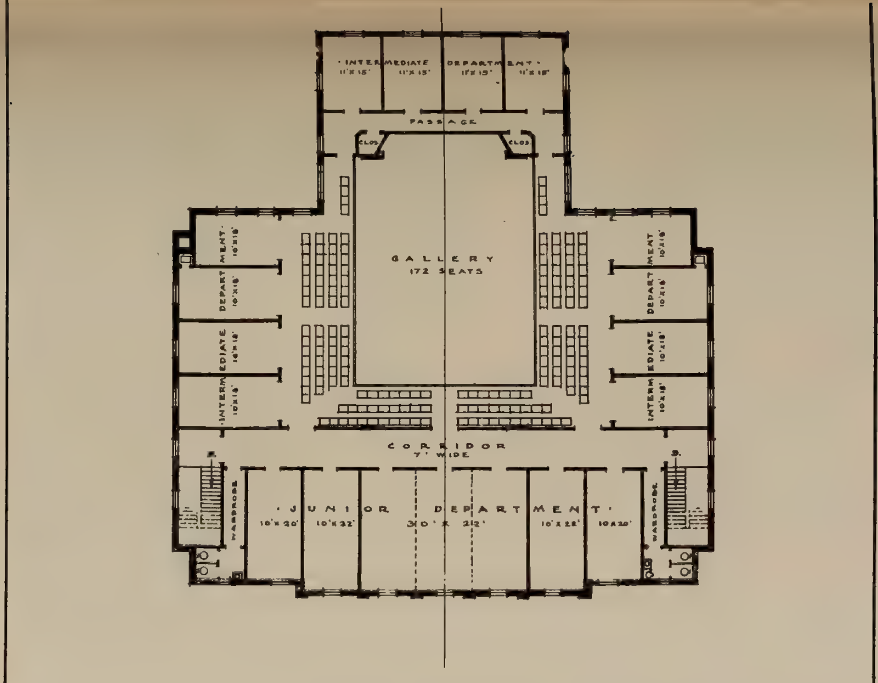


PARISH HOUSE, REFORMED PROTESTANT DUTCH CHURCH, FLATBUSH, BROOKLYN, N. Y.

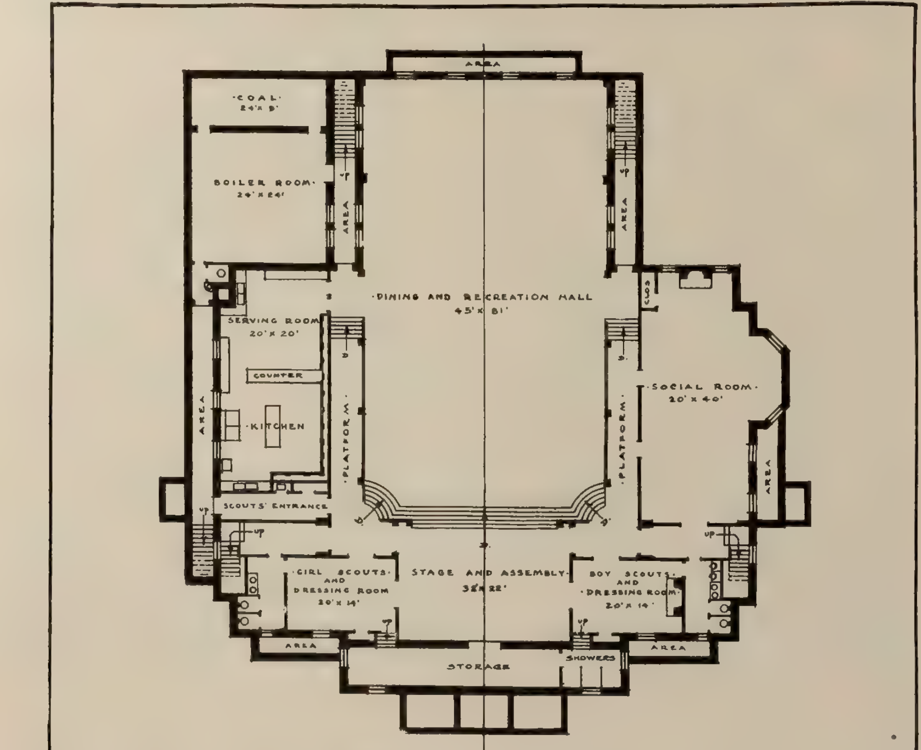
Meyer & Mathieu, Architects.



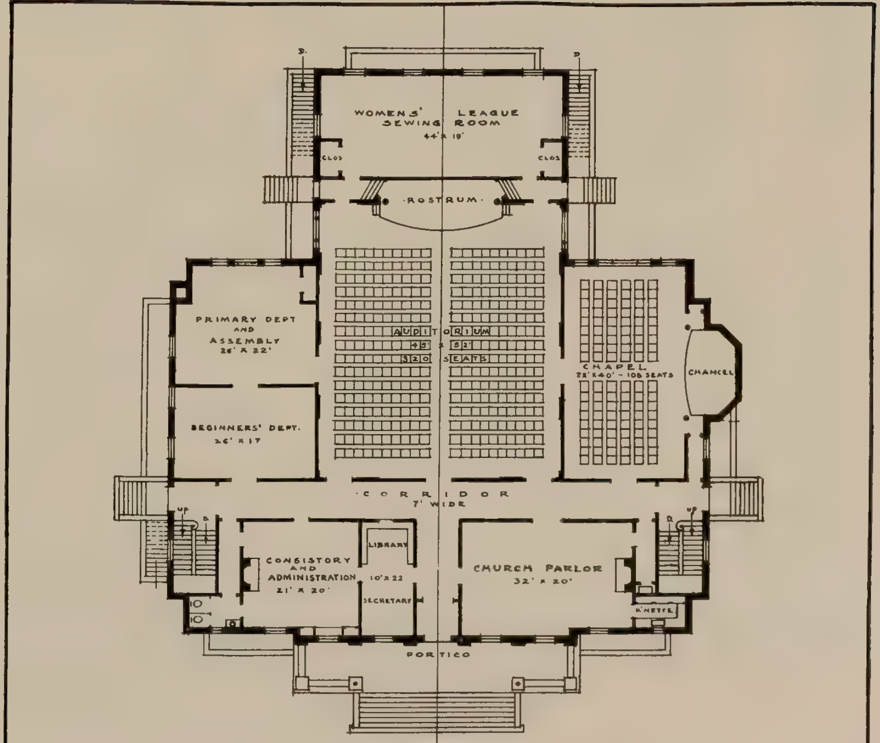
CHAPEL ENTRANCE.



· SECOND · FLOOR · PLAN ·



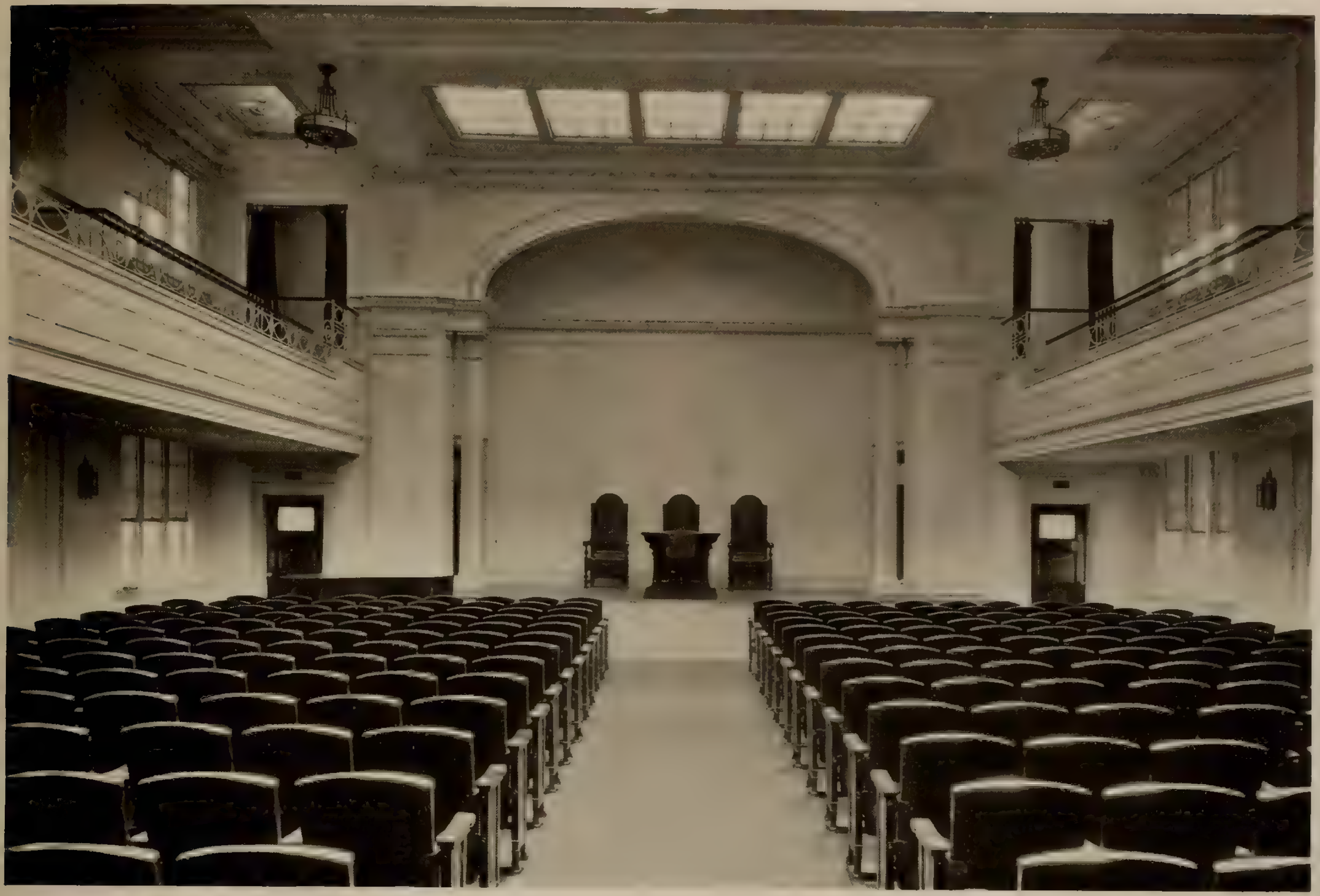
· GROUND · FLOOR · PLAN ·

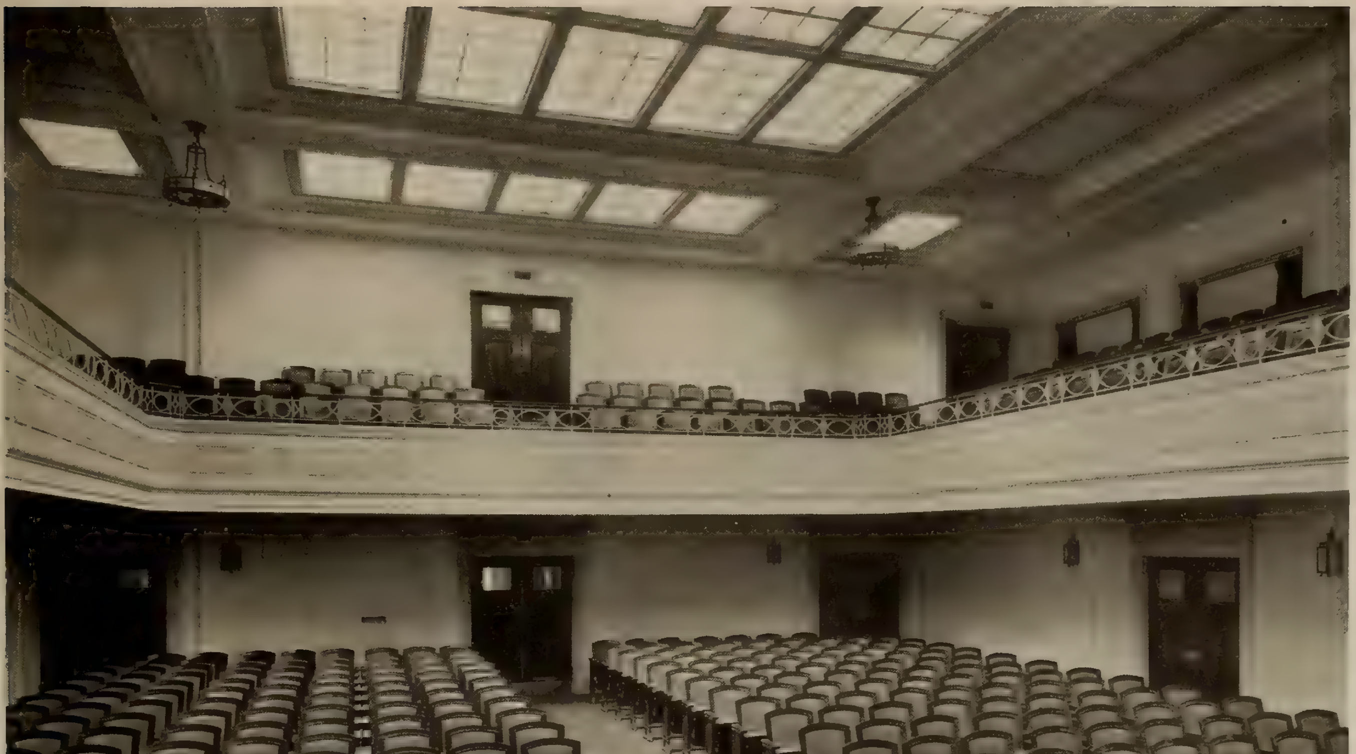


· FIRST · FLOOR · PLAN ·

PARISH HOUSE, REFORMED PROTESTANT DUTCH CHURCH, FLATBUSH, BROOKLYN, N. Y.

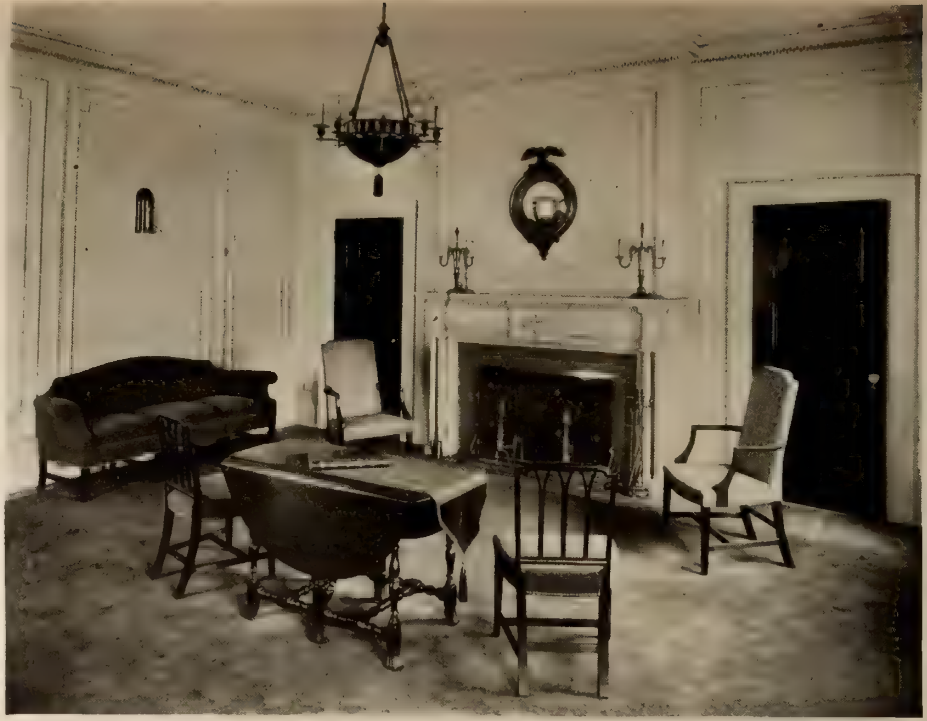
Meyer & Mathieu, Architects.



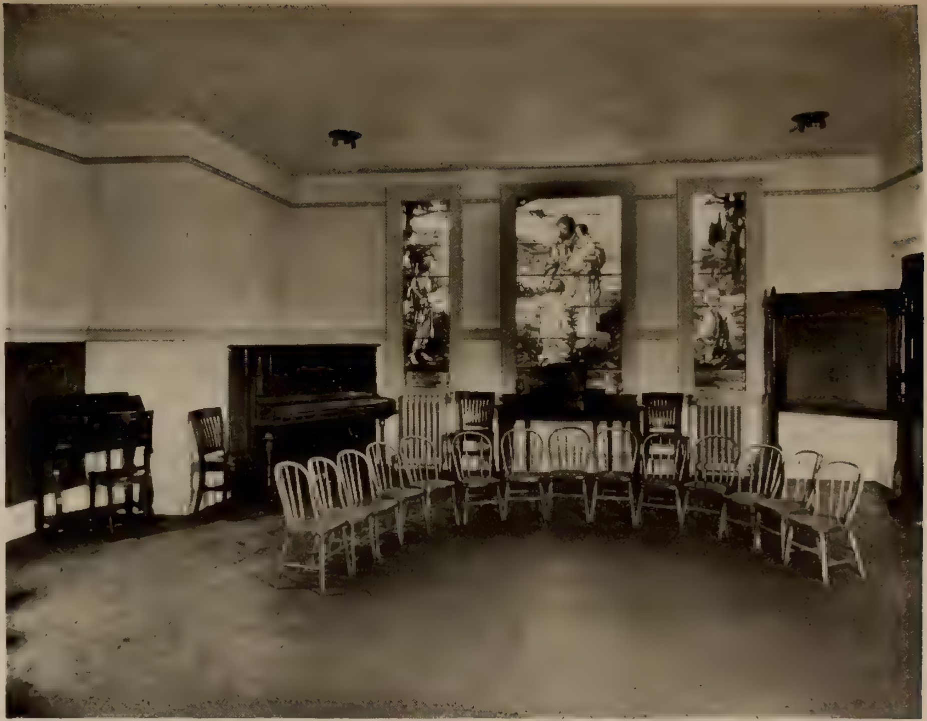


AUDITORIUM, PARISH HOUSE, REFORMED PROTESTANT DUTCH CHURCH, FLATBUSH, BROOKLYN, N. Y.

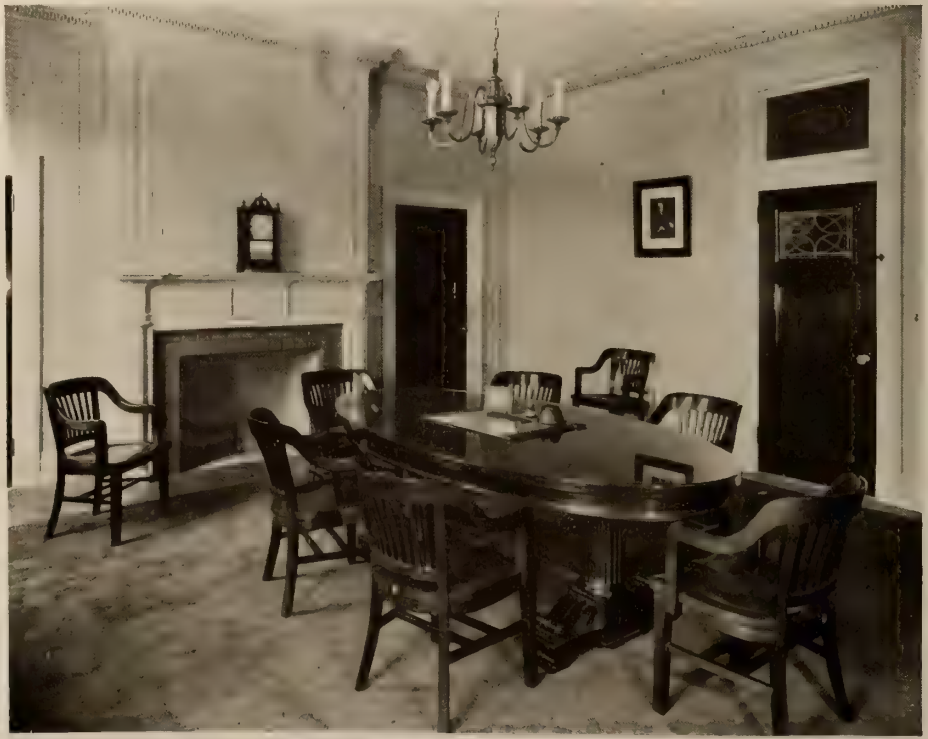
Meyer & Mathieu, Architects.



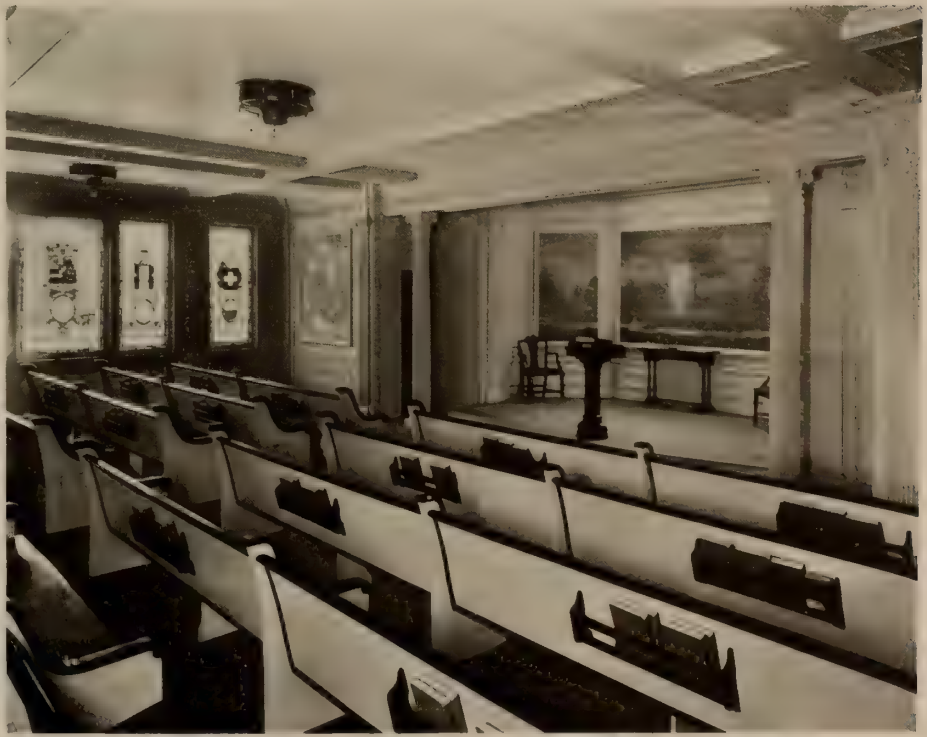
CHURCH PARLOR.



PRIMARY DEPARTMENT.



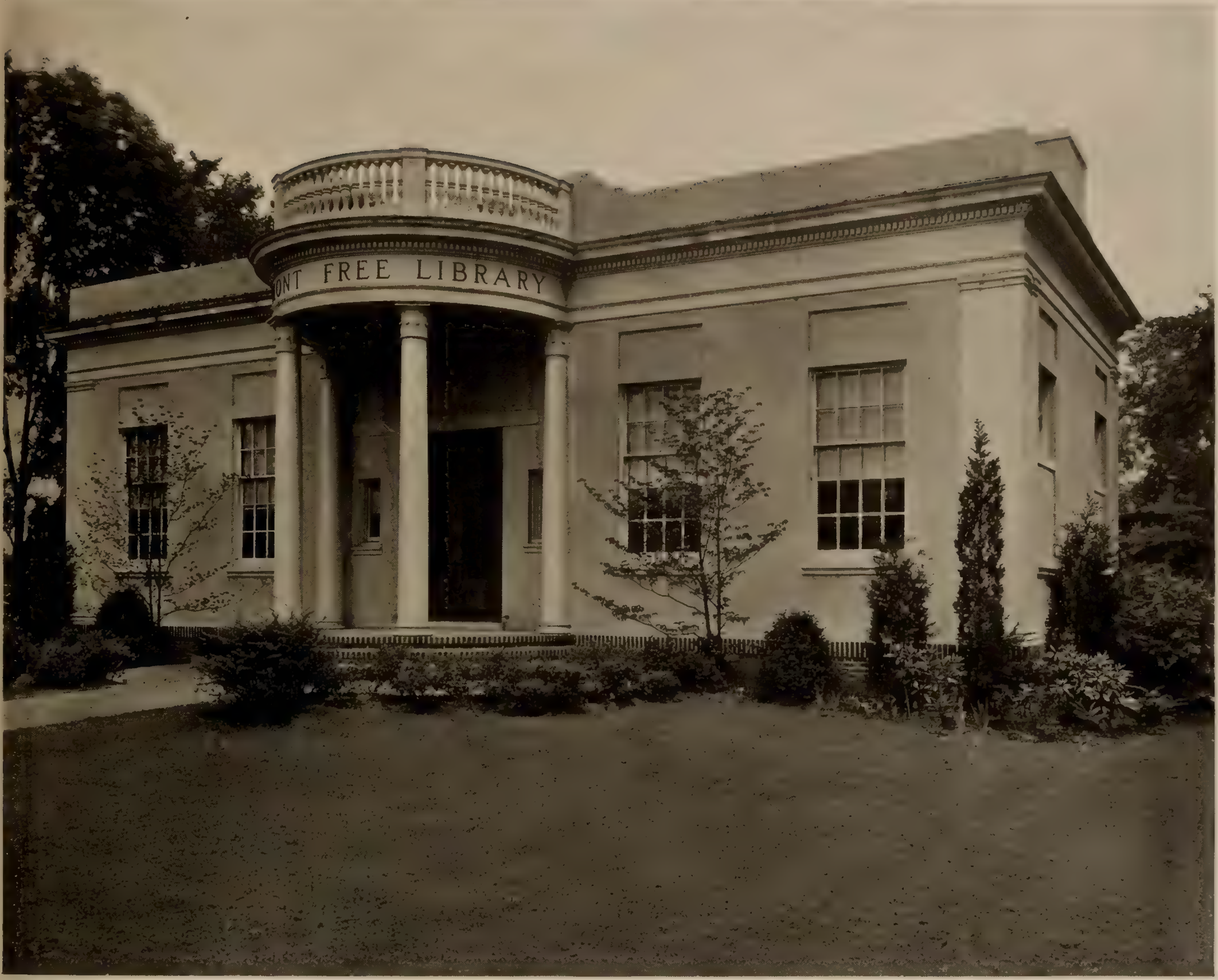
CONSISTORY AND ADMINISTRATION.

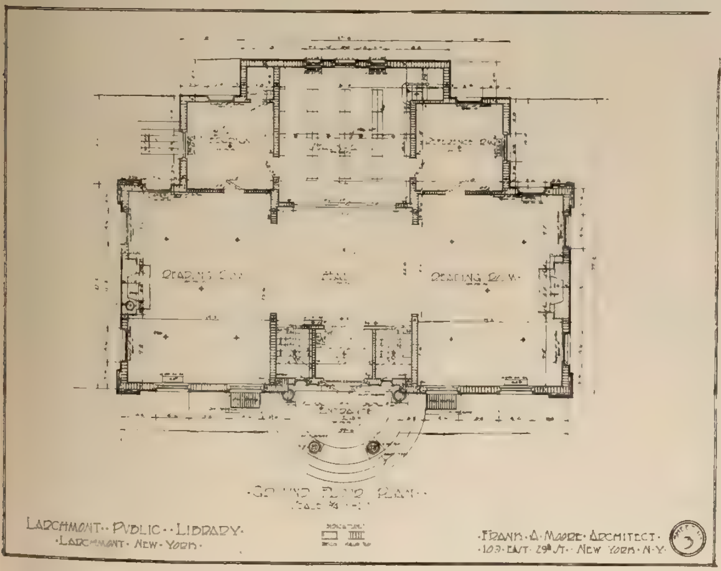


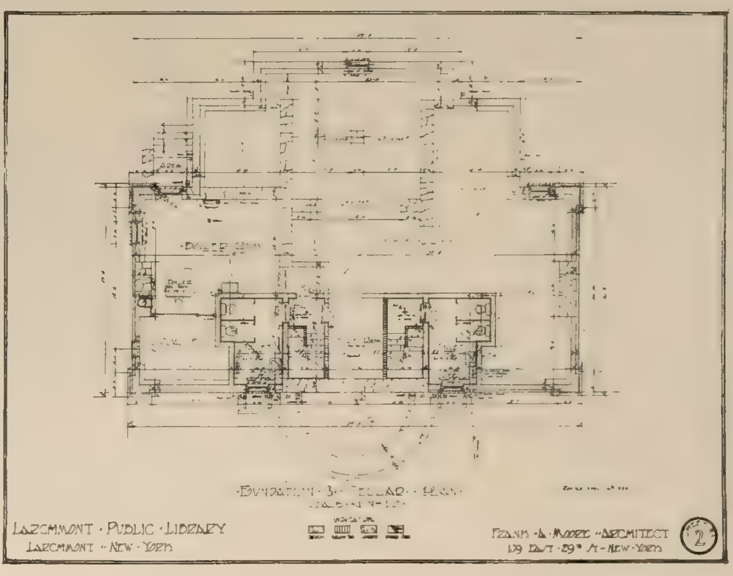
CHAPEL.

Meyer & Mathieu, Architects.

REFORMED PROTESTANT DUTCH CHURCH, FLATBUSH, BROOKLYN, N. Y.

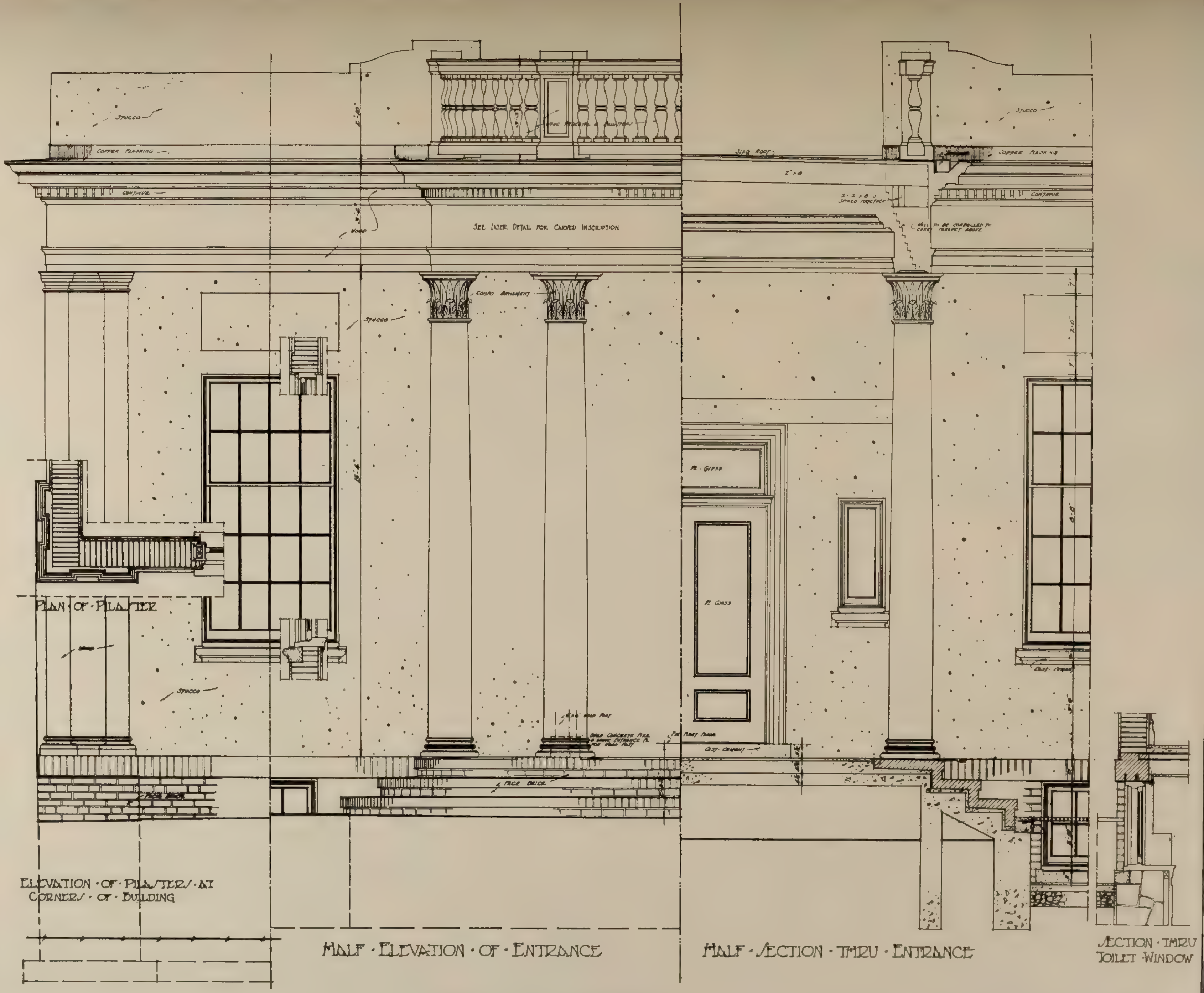



READING ROOM
HALL
READING ROOM
ENTRANCE
·GROUND FLOOR PLAN·
LARCHMONT··PUBLIC··LIBRARY·
·LARCHMONT· NEW· YORK·
·FRANK·A·MOORE·ARCHITECT·
·103·EAST·29th ST··NEW YORK·N·Y·
3



LARCHMONT FREE LIBRARY, LARCHMONT, N. Y.

Frank A. Moore, Architect.


Stucco
Copper flashing
Continue
Wood
See later detail for carved inscription
Wood pedestal & balusters
Compo ornament
Stucco
Slag roof
2" x 8"
2 - 2 x 8 spiked together
Wall to be corbelled to carry parapet above
Copper flashing
Continue
Stucco
Plan of Pilaster
Wood
Stucco
Pl. Glass
Pl. Glass
Cast cement
Wood post
Build concrete pier & brick entrance pl. for wood post
Fin. first floor
Cast cement
Face brick
Face brick
Elevation of Pilasters at Corners of Building
Half Elevation of Entrance
Half Section thru Entrance
Section thru Toilet Window

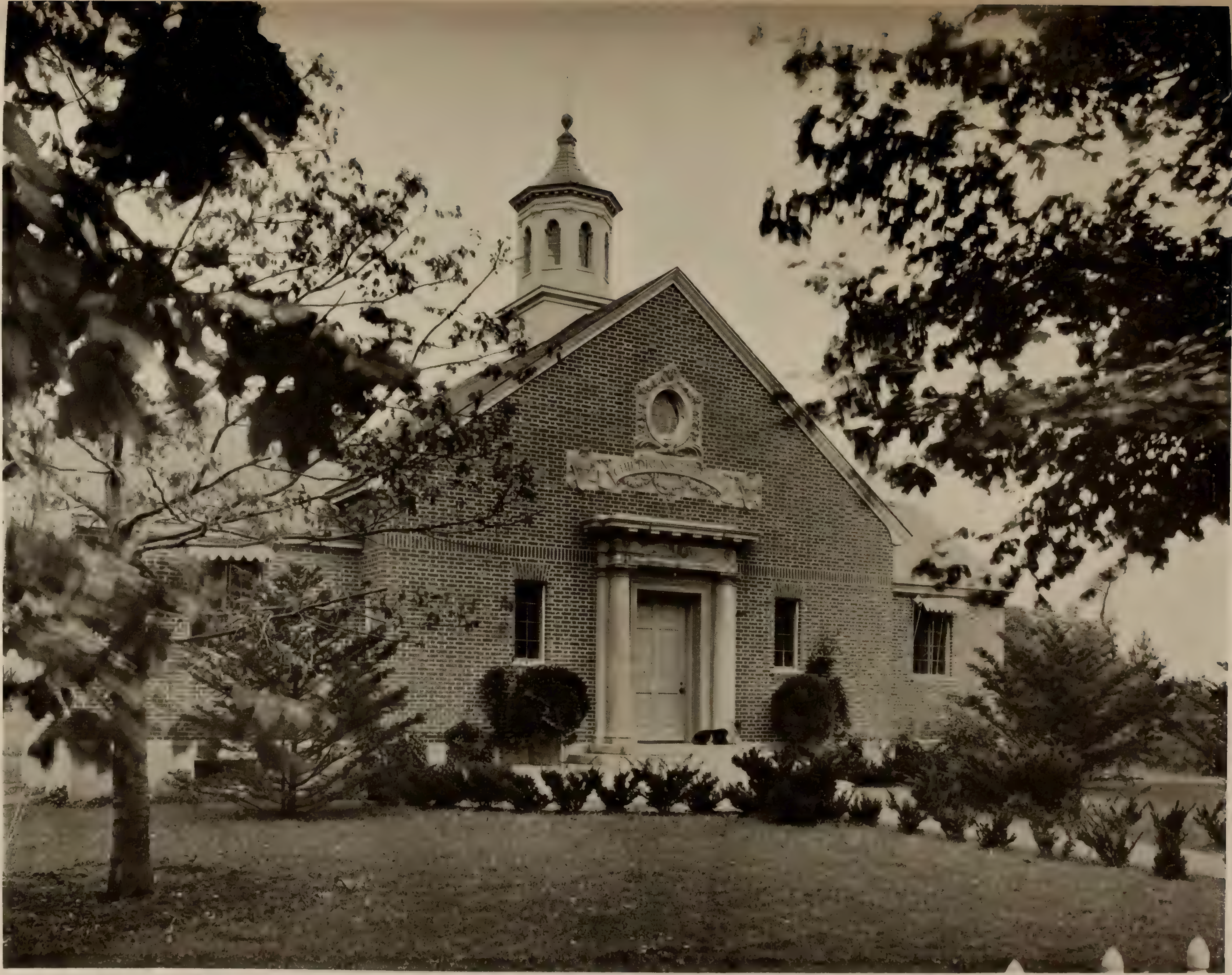
EXTERIOR DETAILS

SCALE - 3/4 IN - 1 FT

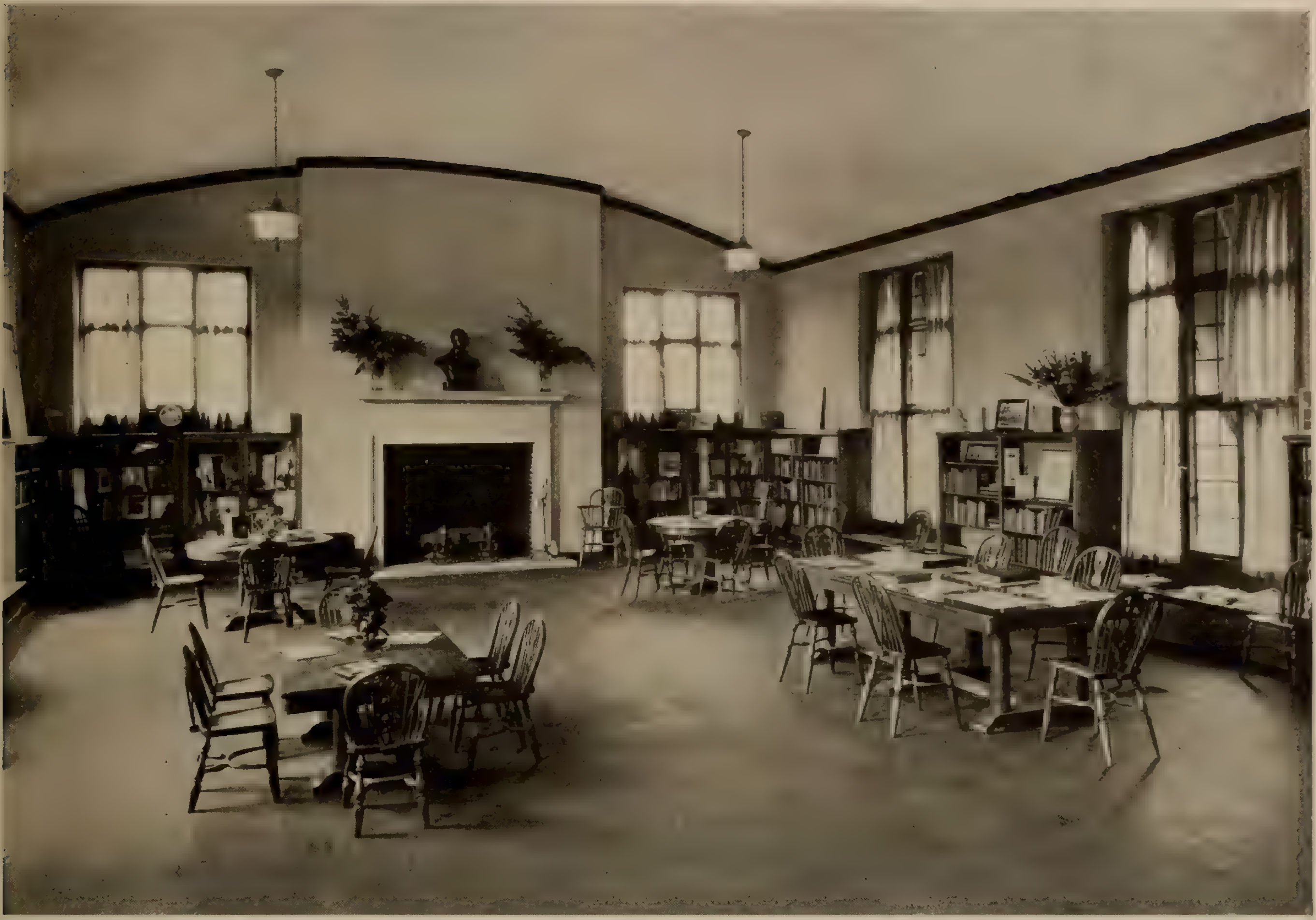
LARCHMONT - PUBLIC - LIBRARY
LARCHMONT - NEW - YORK

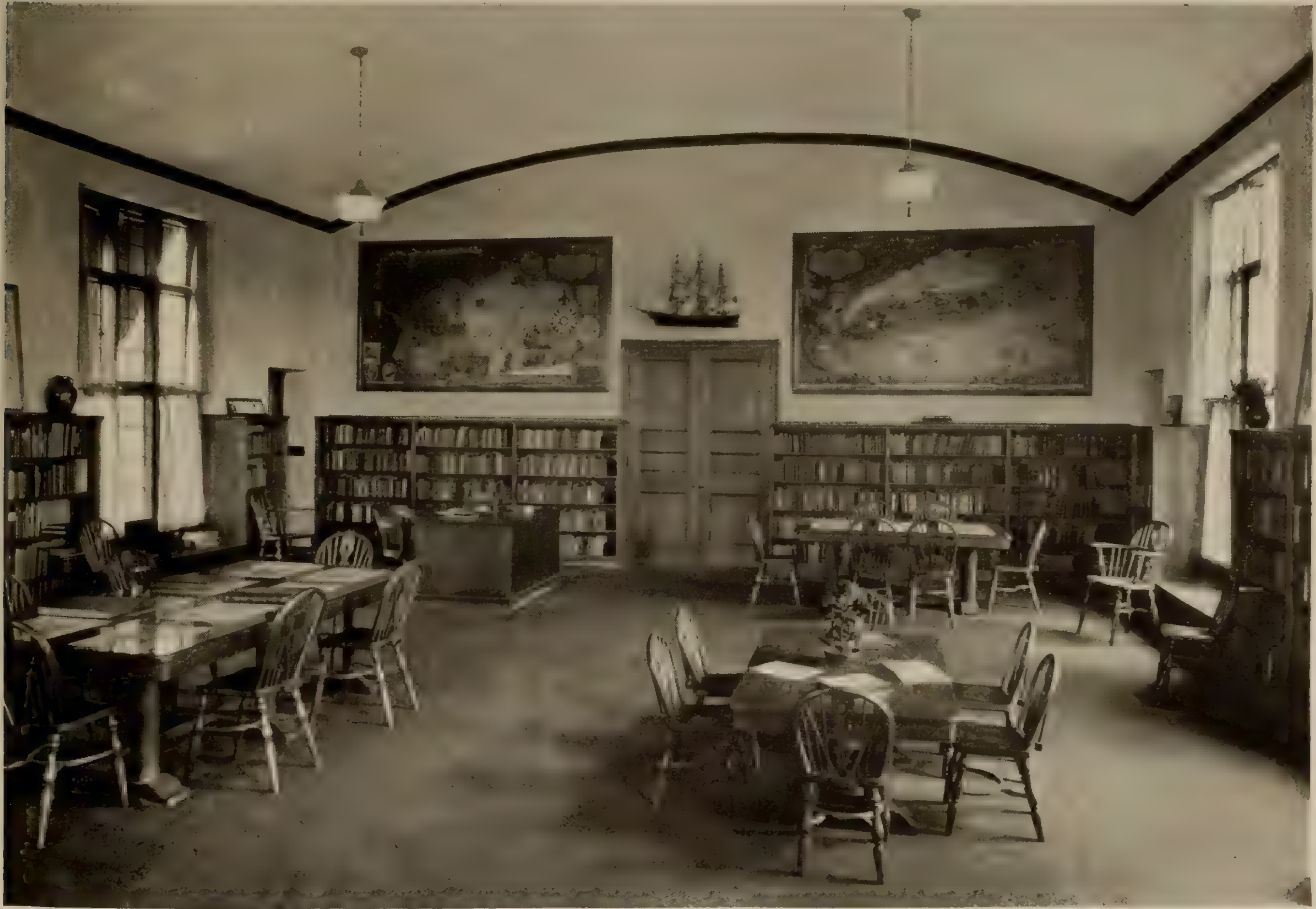
FRANK - A - MOORE - ARCHITECT
109 - EAST - 29TH - ST - NEW - YORK

SHEET NO. 10



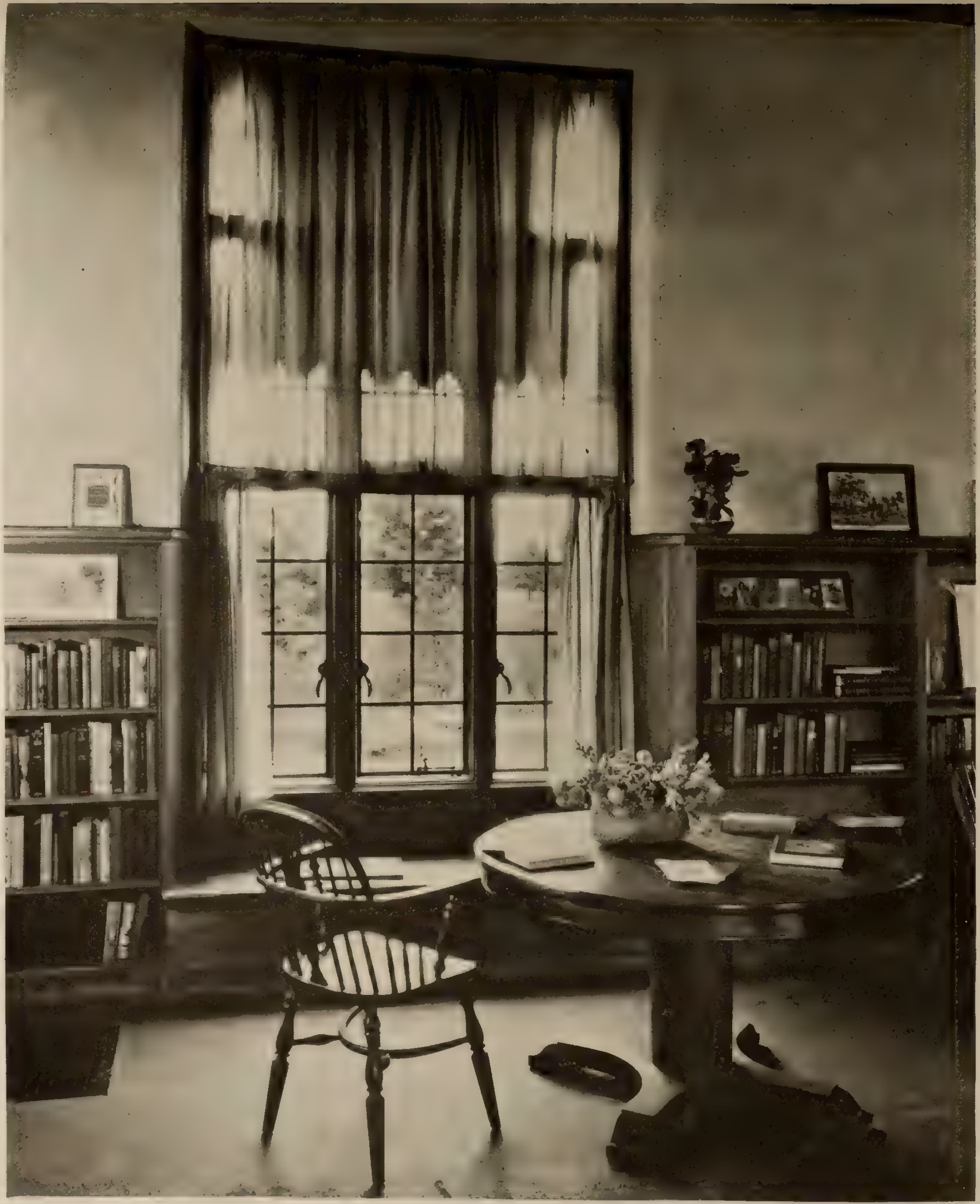
CHILDREN'S LIBRARY, ROBERT BACON MEMORIAL, WESTBURY, LONG ISLAND. Peabody, Wilson & Brown, Architects.



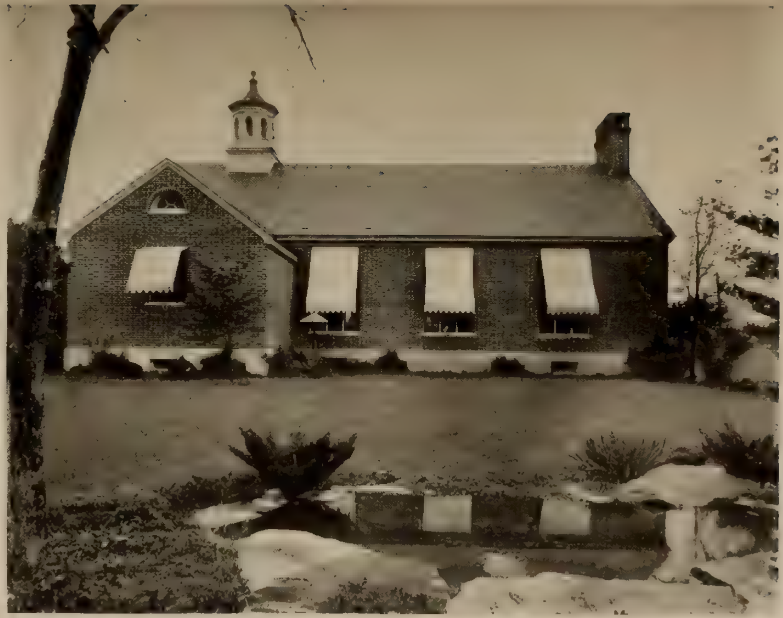


READING-ROOM, CHILDREN'S LIBRARY, ROBERT BACON MEMORIAL, WESTBURY, LONG ISLAND.

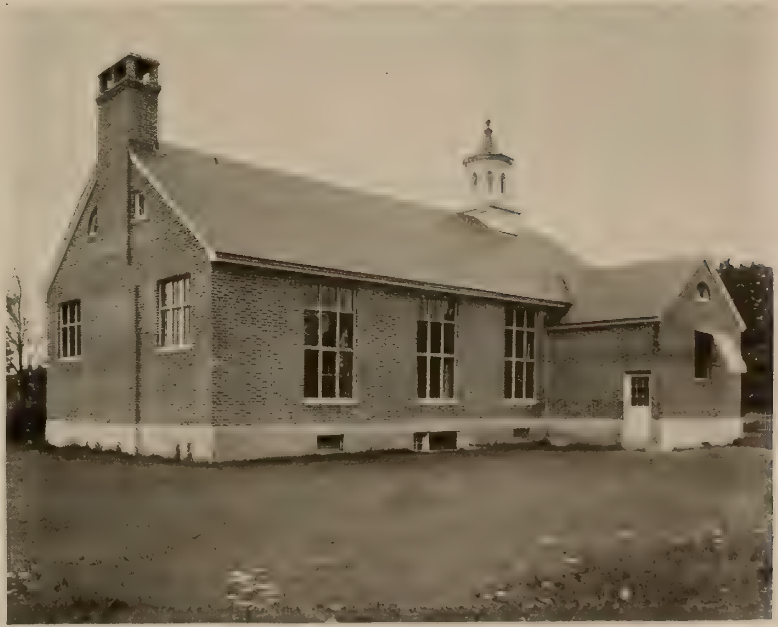
Peabody, Wilson & Brown, Architects.



WINDOW OVERLOOKING BIRD SANCTUARY.



GARDEN AND BIRD SANCTUARY.



REAR AND SIDE VIEWS. Peabody, Wilson & Brown, Architects.

CHILDREN'S LIBRARY, ROBERT BACON MEMORIAL, WESTBURY, LONG ISLAND.

Children's Library, Robert Bacon Memorial

Westbury, Long Island

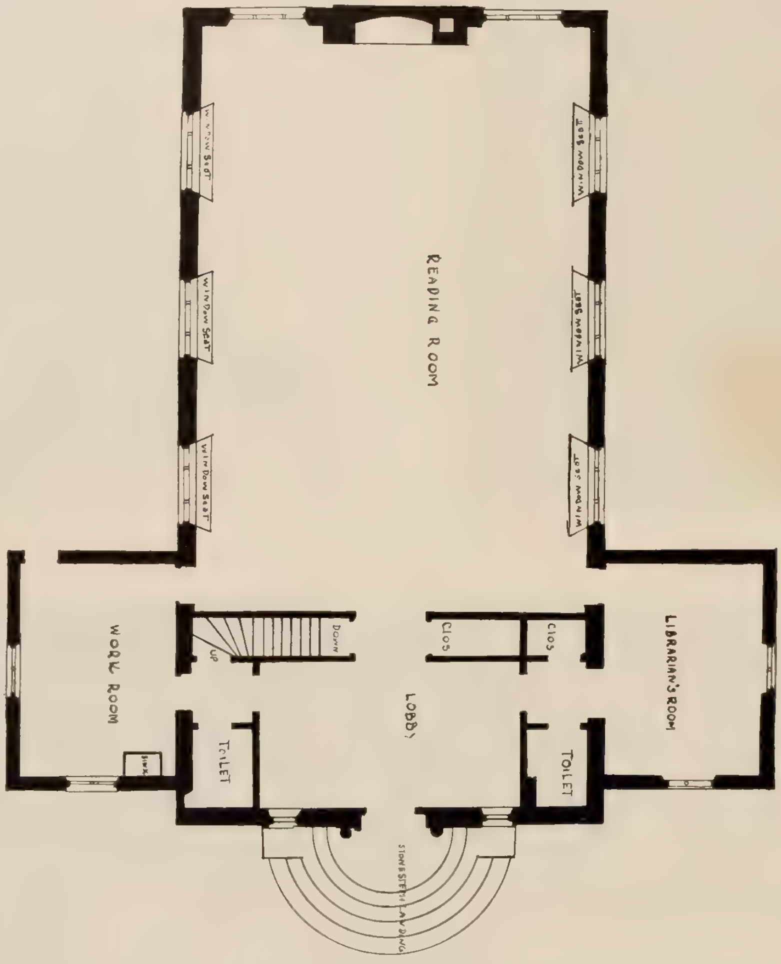
THE Children's Library in Westbury, Long Island, situated on School Street and close by the public schools, occupies the whole end of the block on which it stands. It is the only library organization and building devoted exclusively to the interests of children. Along the street front of the plot, a white picket-fence of old-fashioned design separates the lawn from the pavement; in the centre of this, a gate opens and a brick wall leads up to the front door of the building, set about fifty feet back from the street.

The building, of Colonial type of architecture, is of red brick with light stone trimmings. The front door itself is set between stone columns surmounted by a classic entablature, above which is an oval window in the gable end surrounded by carved stone arabesques and wreaths of fruit and flowers.

The roof of dark gray slate is crowned by a cupola with a window in each of its eight sides. Every evening that the Library is open to the public, the cupola windows are lighted from within and thus shine a welcome to all.

From the front door one enters a square hall and beyond this is the large book-lined reading-room, lighted on two sides by mullioned windows, in each of which is a window-seat which invites the children to linger and read in comfort.

The library room, 30 x 45, is furnished besides with chairs and tables and a huge stone fireplace opposite the entrance, where in winter a cheerful log fire burns. The walls above the bookcases are hung with large colored pictures and the vaulted ceiling adds a charm of the unusual. The whole end of the room at the entrance door is decorated with mural paintings by Stewart Travers, colorful scenes of the kind to catch and hold youthful imaginations.



The reading-room makes up the bulk of the building, except for two small rooms on either side of the entrance hall (12x16 each); on the right the librarian's office and on the left the workroom where books are unpacked and sorted and withdrawn for rebinding. In short, a place apart from the reading-room, where all noisy or otherwise disturbing work can be attended to without interfering with its use.

All of the walls in the building are painted in cheerful, quiet colors, and the woodwork, doors, bookcases and other trim is of butternut, stained and waxed to a soft brown finish. The floors throughout are of noiseless cork tiling.

Everything has been done and no expense spared to give a suitable cheerful and homelike effect appropriate to the uses for which the building is intended. Permanence, cleanliness, and economy of upkeep have been the watchwords throughout.

The equipment, management, and delightfully intimate and friendly atmosphere of this charming little library are quite unique. The landscape setting is most attractive and a part of the grounds has been set aside, with drinking pool, feeding place, and nesting-boxes, as a bird sanctuary.

What Is Taking the Place of Chestnut in Our Forests?

THE Appalachian Forest Experiment Station, established at Asheville by the United States Forest Service, is giving much time and effort to the problem of what will fill in the gaps in Eastern forests caused by the onslaught of the chestnut blight, which is sweeping unchecked through the Southeastern forests at present in its course from New England south. Chinese varieties of chestnut, supposedly immune from the blight, have been tried in North Carolina, but have not so far proved able to withstand the rigors of the climate. In connection with further experiments along this line, Mr. C. F. Korstian, of the Appalachian Station, has recently been studying natural reproduction in more northerly forest areas ravaged by the blight. Of all species replacing chestnut in Pennsylvania, New Jersey, and southern New England, where chestnut was practically wiped out some years ago, Mr. Korstian found the chestnut oak to be one of the most abundant and widely distributed. This is true as far south as the Carolinas. In general, Mr. Korstian found the smaller blanks in the forest filled by the crowns of neighboring trees, notably of oak, as a result of release from the chestnut's competition. Larger openings are for the most part being filled by seedlings and sprouts of oaks, white ash, and hickory, all valuable species. In northern New Jersey pine is also coming in naturally in these openings.

Co-operative Apartment-Houses of the Smaller Type: How to Handle Them

By Roy G. Pratt, Architect

Member Executive Committee, Apartment Division, National Real Estate Board

IN this article I have outlined the methods which I have used in Philadelphia and Baltimore. In these cities very little is known about co-operative apartments and at the present time there have been only three buildings erected in each city. Practically all of the individual apartments have been sold. In most instances the purchasers have been those who have known of the advantages of joint ownership from other cities where the plan has been successfully worked out.

In order to have first-hand information regarding the attitude toward the co-operative movement throughout the United States, a letter was written to the secretaries of all the real-estate boards asking them to advise if apartment buildings had been built and sold on the joint-ownership plan in their cities. From the replies received it develops that there are only sixteen cities in the entire United States where co-operative apartments have been erected. Three cities report a trial, but also a failure.

There are many varieties of small co-operative apartment-houses. It is even possible to design one small enough to contain just two apartments, the exterior having the appearance of a small residence. A suggestion along this line is shown among the plans exhibited here. There are two interpretations of the meaning of the term "small co-operative apartments."

(1) A building containing a small number of apartments with suites of living-room, dining-room, pantry, kitchen, two bedrooms and two baths.

(2) A building having a large number of apartments but with small suites of living-room, bedroom, kitchen, dining alcove, and bath—called in many cities "efficiency apartments."

In Philadelphia and Baltimore, the apartment-houses have six or eight families in three or four story buildings—and containing six rooms, two or three baths, maids' rooms and individual garage. And here I might add that if the co-operative plan is new in any city, my advice to the pioneers going into that city is to content themselves for the first year or two with the building of several six or eight family buildings and later on, after the inhabitants are educated (that is exactly what must be done with them so they will even consider the advisability of buying an apartment)—after this is accomplished then there is time enough to consider the personal monetary gain through the erection of the larger buildings. Philadelphia is the third-largest city in the United States and yet after two years of so-called education there are only three buildings there which have been sold on the 100 per cent co-operative plan. I know of three large operations which were efficiently planned and were full of merit—but the men who were back of them told me that the city was not ready for the co-operative idea yet and that there was much more missionary work necessary. I am outlining the Philadelphia situation only as a warning to any one seeking to develop new territory. Much patience is necessary to put over this new idea and my plan in Philadelphia has been to select the best residential apartment sections and build one or two six or eight family buildings in each section and after these have been sold decide on the next best type. If a building is properly built and satisfies the demands of the apartment-house dweller—then the money spent for a number of small apartment-houses placed in carefully selected locations will be the best kind of advertising for future business. Opening up new territory where the co-operative idea is wholly unknown and untried is a difficult problem. On the other hand, the co-operative plan of owning an individual apartment is so sound that as soon as you have convinced your city of its real value your future business will be assured. The writer has accepted an invitation to go to Miami, Fla., to erect a twenty-four-family apartment on the co-operative plan—so you can see he has faith in the idea or he would not branch out and open an office in territory new to him. Feeling that the first stage of educating the public has been passed in my city, this coming year will find the Philadelphians being offered the purchase of apartments on the 100 per cent co-operative plan in one of four buildings, an eight, a ten, an eighteen and a twenty-four family. Incidentally the eighteen-family building will have three bedrooms in each apartment. For information and suggestions, only for those who are considering the building of small apartment-houses, the elevations and floor plans of all my Baltimore and Philadelphia buildings, including the larger ones for this year, are shown here.

As this article is presented primarily for the benefit of those unfamiliar with the handling of these small apartments, I shall give an account of my personal experiences in Philadelphia.

First, the construction or holding company is organized as a corporation would be. The land and the building to be erected would remain in its possession until completion, at which time a second corporation is formed, the stock in this latter company being bought by the purchasers of the individual apartments.

The selection of the site is of utmost importance. A building costs practically the same in any location in a city, but its selling value depends on its location. It should be in the vicinity of railroad and trolley lines, and schools, churches, and stores. It is a real asset if the residences in the neighborhood of the apartments sell for five or six thousand dollars more than the individual apartments.

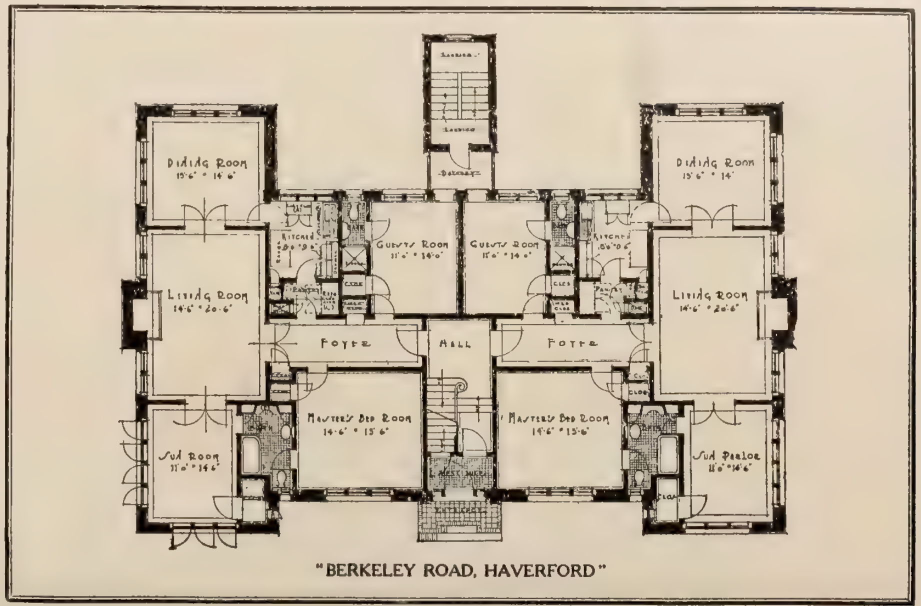
Much attention should be paid to the design of the building—the exterior should present a warm and inviting appearance. Considerable money spent for shrubbery and landscaping is not wasted. It must always be remembered that the apartments are to be sold, not rented, and when a person purchases an apartment, he is thinking in terms of a home and every detail which he would expect in buying an individual residence should be incorporated in the apartment you are trying to sell him. Particularly when the detail of design of the interior is being considered, the layout and size of the rooms is of primary importance. If an apartment is to be rented the rooms may be small in size with low ceilings but if it is to be sold, it is the writer's opinion that the ceiling should be nine feet in the clear and the minimum size of rooms should be as follows:

Living-room	14′×21′
Dining-room	13′ 6″×14′ 6″
Kitchen	8′×11′
M. B. R.	13′ 6″×14′ 6″

Baltimore, Md. Six-family co-operative. Same plan as Berkeley Arms.

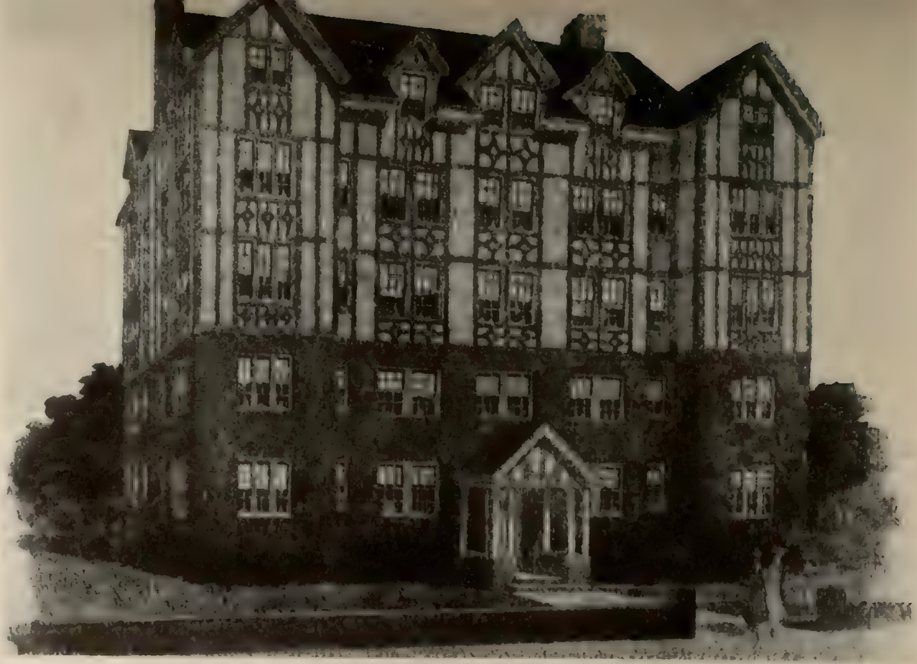
Berkeley Arms, Haverford, Pa.

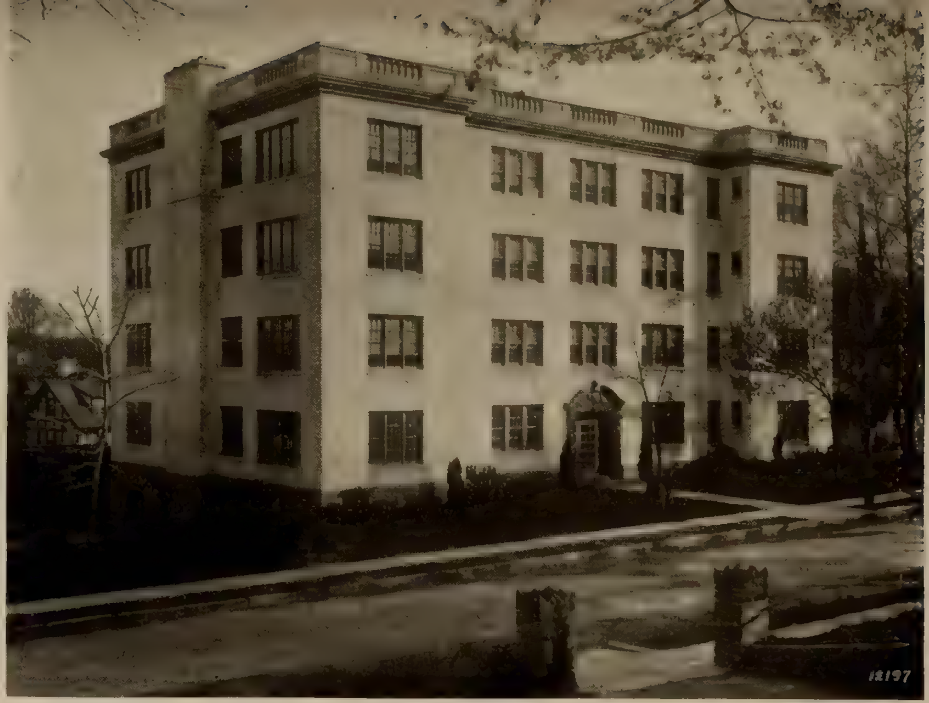
Carpenter Lane, Germantown Pa. Eight-family co-operative. Same plan as Berkeley Arms.

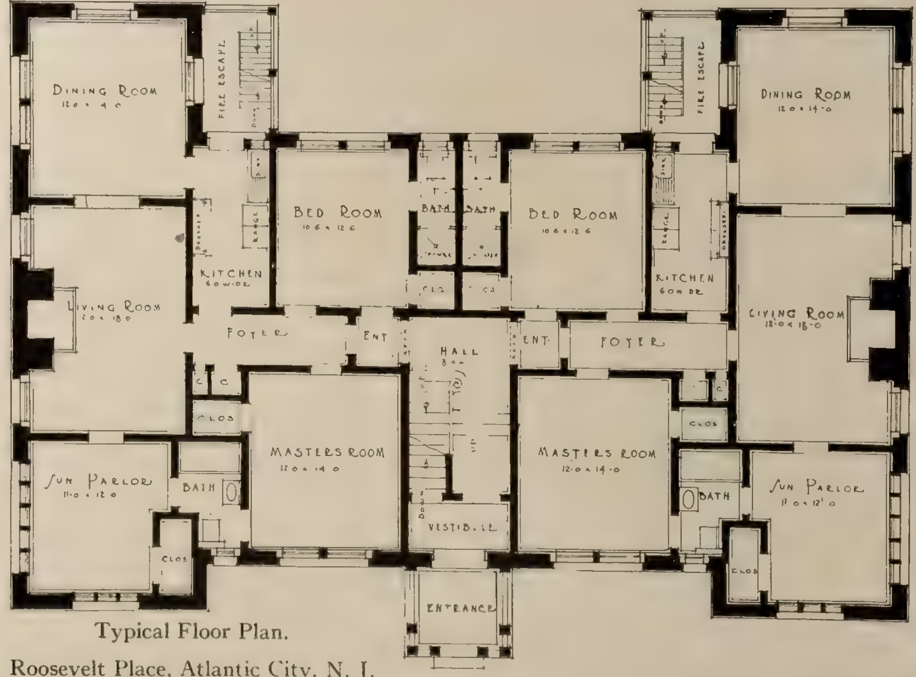


Berkeley Arms, Haverford, Pa. Six-family co-operative. Roy G. Pratt, Architect.

CO-OPERATIVE APARTMENT-HOUSES OF THE SMALLER TYPE.

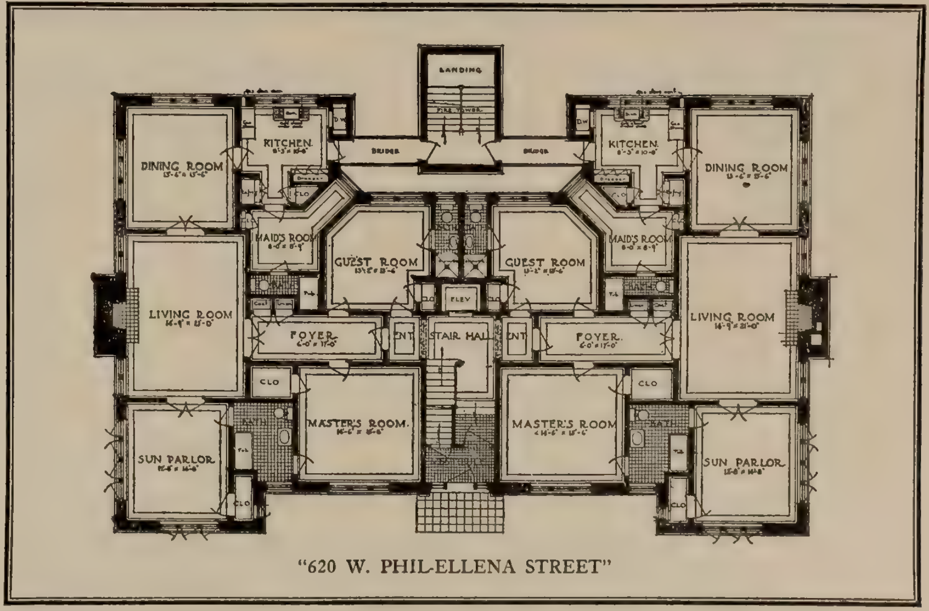






Typical Floor Plan.

Roosevelt Place, Atlantic City, N. J.
Eight-family co-operative.



620 West Phil-Ellena Street, Germantown, Pa. Roy G. Pratt, Architect.
Eight-family co-operative.

CO-OPERATIVE APARTMENT-HOUSES OF THE SMALLER TYPE.

G. B. R.	11'×13'
Sun-porch	10'×14'
Maid's room	7'×10'

The sleeping quarters should be as far removed as possible from the living-room. In the writer's opinion, probably eighty-five to ninety per cent of all apartments have been purchased because they have passed the wives', not the husbands' inspection and approval. About all the husband gets for his check is the shower bath. As long as the woman has to be pleased, particular attention should be paid to the design and arrangement of the bathrooms and kitchens. The fireplace burning wood logs always appeals to the woman. In Philadelphia gas logs are popular, so each fireplace has a gas connection. Ample closet-rooms with electric lights should be provided. The more electrical outlets and base receptacles, the more pleasing. The above details are immediately noticed by the woman purchaser. Modern apartments don't seem complete these days without an incinerator, a dumb waiter, mechanical refrigeration, and a complete laundry unit. Other items of less importance but which are, in my opinion, selling-points, are wall safes, built-in china closets in dining-rooms, ventilator fans in kitchens, bathroom electric heaters, vacuum systems, ironing-boards, towel-driers in kitchen, full-length mirrors in each bedroom, radio outlets, combination sink and dish washing-machine. These are items which seem to appeal to the purchaser and while the cost per apartment is increased, yet the selling is made much easier.

As an accessory, a disappearing bed has a real value. Another feature which interests a person buying before the building is completed is that he, or rather, she, may make certain selections. Certain allowances are made for the electric fixtures, the wall coverings, the gas range, and the fireplace mantel and if a purchaser cares to select any of the above items it is his privilege and he may increase the costs to whatever limit he desires. Also he may change the arrangement of the partitions in his own apartment if the strength of the building is not impaired. The buyer also may have any additional work done in his apartment by our workmen at a cost of labor and material plus ten per cent. So, with these individual selections, a purchaser feels that he, and not the architect, designed his apartment.

All apartment buildings four stories or more, which are to be co-operatively sold, should have an automatic elevator. True the largest apartment-house group in the world—the Roosevelt, in New York City, is six stories, and is a walk-up—but it would be a very difficult matter to sell the individual apartments on the fifth and sixth floors. The other extreme is the eighteen-family to be built this year in Elkins Park, Philadelphia. It will be a three-story building, and will have an automatic elevator. In the writer's opinion this is a needless expenditure of money. The first floor will never use it, the second floor can walk the one flight upstairs quicker than getting in and out. Owners on these floors will object to paying their share of maintenance just for the accommodation of the top floor. It would be better to reduce the selling price on third floor.

There is considerable discussion just now as to the proper location of the maid's room and bath. Some apartments have been built with the basement windows above grade and servants' quarters arranged for there. Others, particularly in the larger buildings, have laid out the entire top floor in maids' rooms. In both places, the maids are given every opportunity to meet and discuss each other's wages, privileges, etc. From the writer's discussion with his purchasers, having the maid's room and bath in the apartment itself is much more satisfactory and his present and future designs will be drawn in this manner.

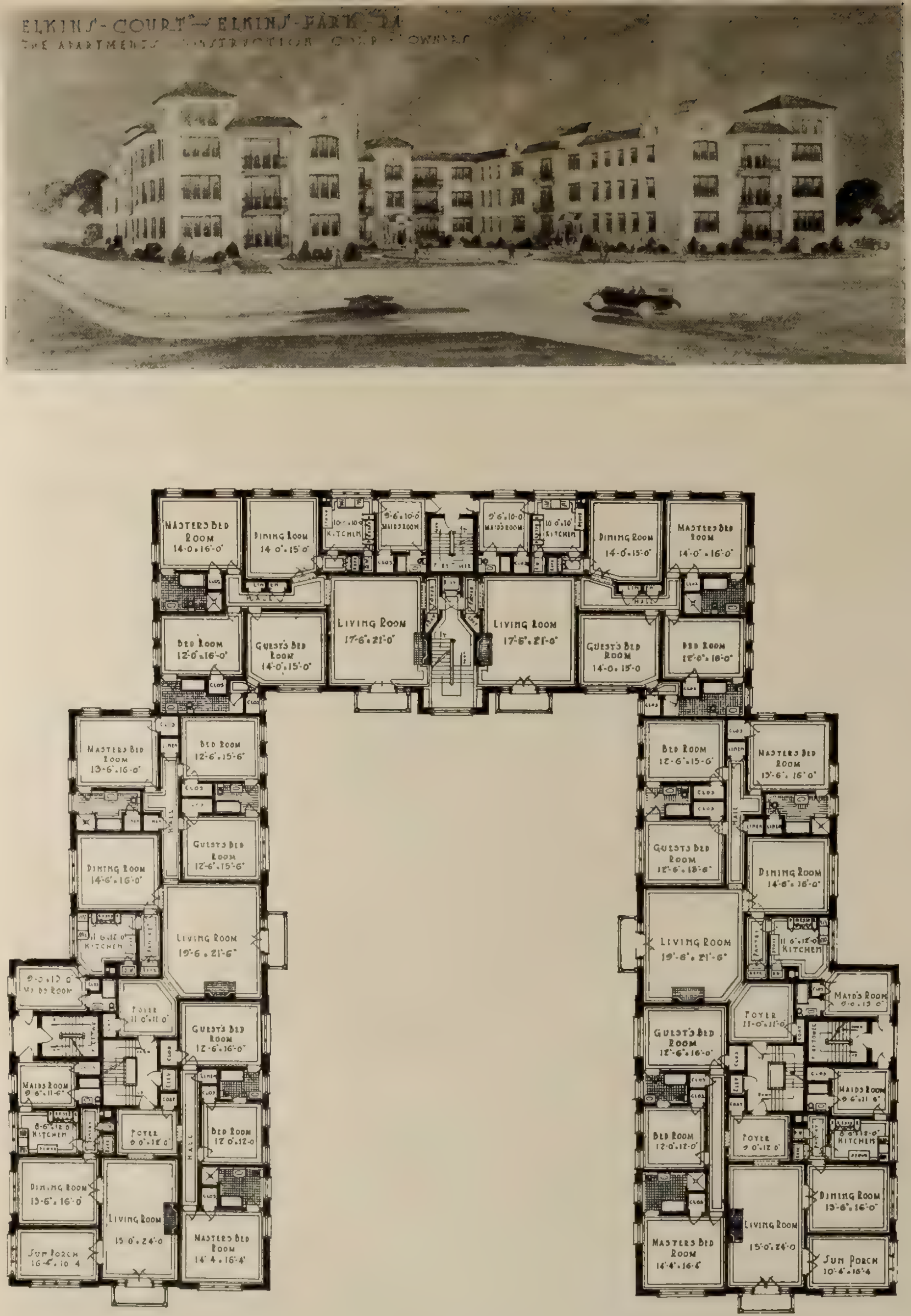
Another big selling-point is the individual garage which is sold with each apartment. The garage may be built either at the rear of the property or in the basement. Arrangements should be made for several double-garages as many times a sale might be lost if accommodations for two cars are not possible.

Having finally decided upon just which of the above items you think necessary for your particular apartment, the next step is to arrive at the selling price per apartment. This is the summation of the lot cost, the building cost, financing cost, real-estate commission, and the profit. The total will be for the entire building and the next step will be to prorate this amount among the various apartments, depending on number of square feet, location in the building, exposure and other points of advantage. The amount of mortgage or mortgages is the next consideration. In financing a co-operative apartment-house, the amount of mortgages placed on the property has been subject to considerable discussion. Some contend that fifty per cent of the value of the land and building is sufficient. There are others who feel that it is perfectly safe to place first and second mortgages up to seventy per cent or seventy-five per cent, thereby making the cash required considerably less. The general practice in New York City and Chicago is to place only first mortgages and for only about fifty per cent of the land and building value. In Philadelphia, first and second mortgages are placed up to seventy-five per cent and the writer has a source whereby the purchaser may borrow half of the cash required for the stock certificate and have three years to pay it off. This is working successfully and will be used much more in the future in our city.

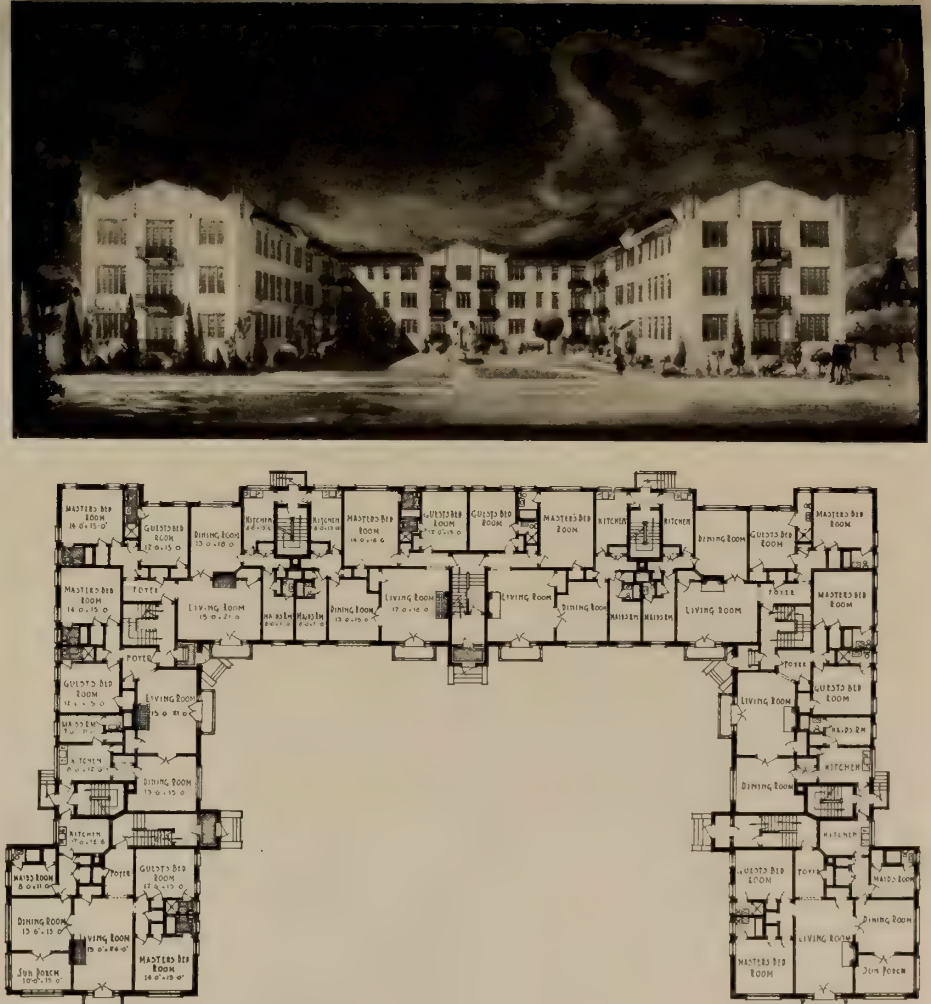
The next step is to sell the apartments and this is, particularly in the new territory, the hardest problem. In cities where the co-operative plan is unknown much newspaper advertising is necessary and this must be along educational lines, telling what the plan is, the good points, etc. Then the particular apartment building must be featured as to its interesting points. The showing of floor plans in the newspapers seems to reach the prospect best. Also, there should be in your office a carefully prepared prospectus giving the elevation and the floor plan of your apartment-house, several paragraphs describing the joint ownership plan, and also the details pertaining to your building. The more elaborately this prospectus is printed, the more dignity and prestige will be given to your development. The writer feels that the financial plan showing the cash required, how payments may be made, and the approximate operating expenses, should be printed in the prospectus, as it saves needless explanations at a later time.

To keep the co-operative idea before the public, whenever an apartment is sold the real-estate editor of your papers should be given the name of the purchaser. Two apartments have been sold in Philadelphia directly as a result of these notices. Large, artistic signs in carefully selected colorings and wording should be erected on the grounds where the apartment is to be built.

Assuming that all the individual apartments in the building have been sold, the final stage of the development is the transferring of the land and building to the new corporation, which is composed entirely of those who have purchased the apartments. Any person that intends to enter the co-operative apartment field will do well first to purchase the book published by the Co-operative Apartment Association of Chicago, "Standardized Methods for Co-Operative Apartment Buildings." In this valuable book will


ELKINS-COURT—ELKINS-PARK, PA
THE APARTMENTS CONSTRUCTION CORP. OWNERS
MASTERS BED ROOM 14-0 x 16-0
DINING ROOM 14-0 x 15-0
LIVING ROOM 17-6 x 21-0
BED ROOM 12-6 x 16-0
GUESTS BED ROOM 14-0 x 15-0
KITCHEN
MAIDS ROOM
MASTERS BED ROOM 13-6 x 16-0
BED ROOM 12-6 x 15-6
GUESTS BED ROOM 12-6 x 15-6
DINING ROOM 14-6 x 16-0
LIVING ROOM 19-6 x 21-6
FOYER
GUESTS BED ROOM 12-6 x 16-0
SUN PORCH
HALL
CLOS

Elkins Court Apartments, Philadelphia, Pa. Eighteen-family co-operative.



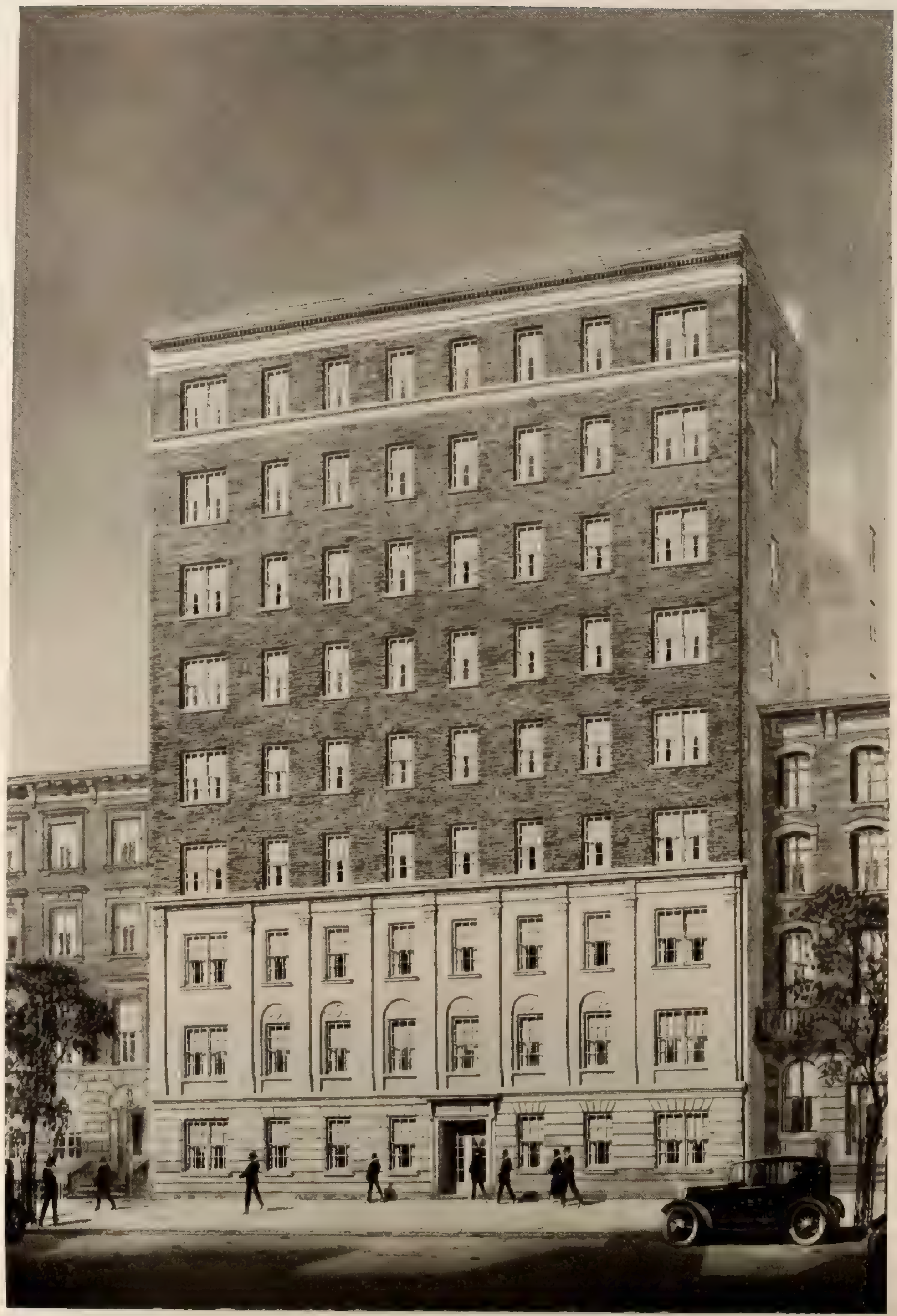
Miami, Fla. Twenty-four-family co-operative.

be found all the necessary forms needed by the corporation having final possession of the property. The forms of lease and stock certificate, and samples of all organization papers needed will be found in this volume. It has been of real assistance to the writer in his Philadelphia operations and very few changes legal or otherwise have been necessary to meet our local conditions.

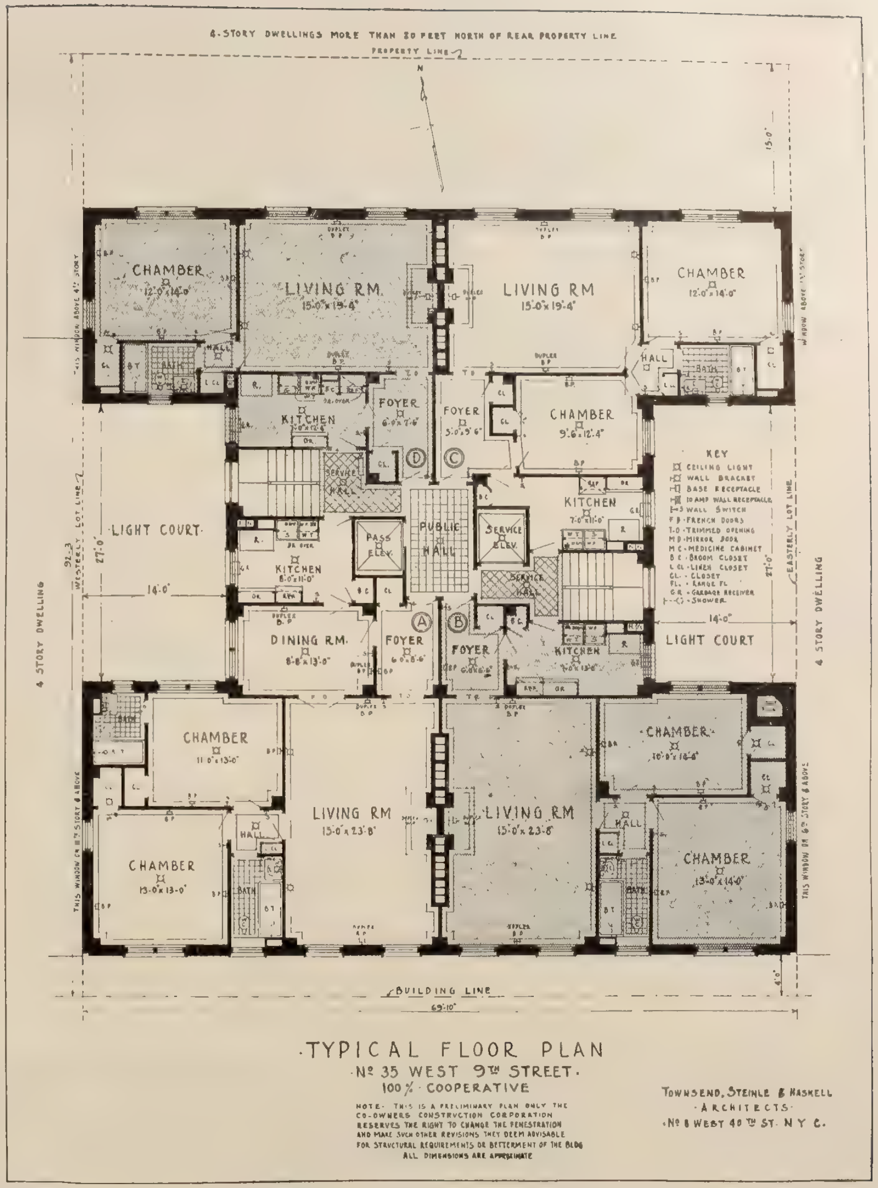
After the final transfer has been made and you have been paid in full for your labors, if you intend to continue to build these co-operative apartments, don't drop the purchasers of your new apartments. Give them personal attention, help them to get running smoothly, offer your advice as to the management of the building. If you expect them to talk to your future prospects favorably, you must make them continue to feel that they have made a wise and satisfactory investment.

CO-OPERATIVE APARTMENT-HOUSES OF THE SMALLER TYPE.

Roy G. Pratt, Architect.



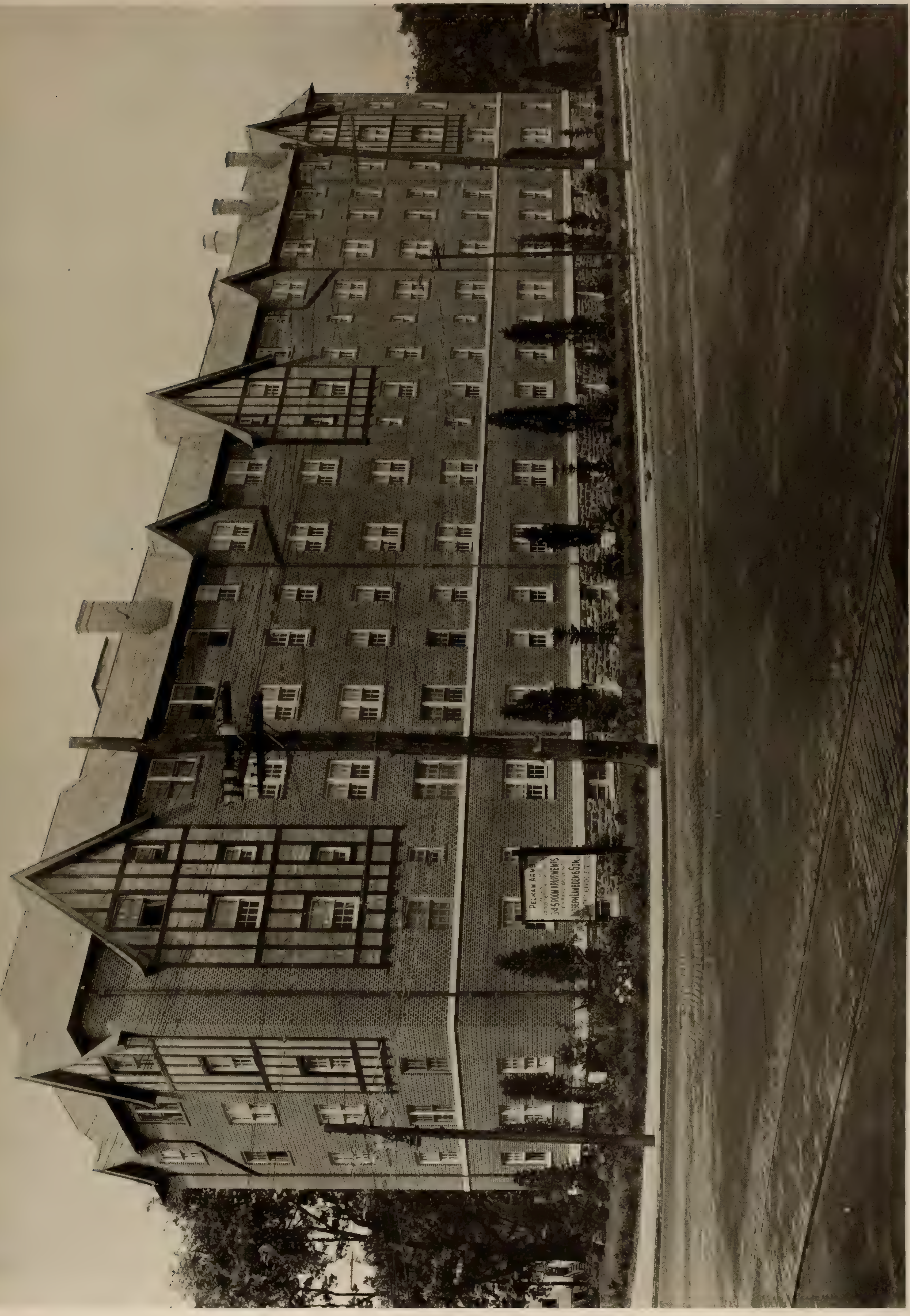
Design for co-operative apartments, 35 West 9th Street, New York.



DESCRIPTION OF PROPOSED BUILDING

The building is a fireproof structure, nine stories in height. It contains thirty-six typical apartments, four apartments on each floor, one of five rooms and two baths, two of four rooms and one bath, and one of three rooms and one bath. The façade will be carried out in a modified Adam style of architecture with lower stories of variegated Indiana limestone and ornamented cast-stone, upper stories of rough texture red brick. The entire exterior will have the air of quiet dignity and charm of the old New York houses of that period. All living-rooms have open wood-burning fireplaces. Master baths are equipped with the latest fixtures and shower. All kitchens are provided with dressers, range, icebox, combination sink and washtub, and linoleum for the floor. The building will be ready for occupancy September, 1926, and is "100 per cent co-operative ownership."

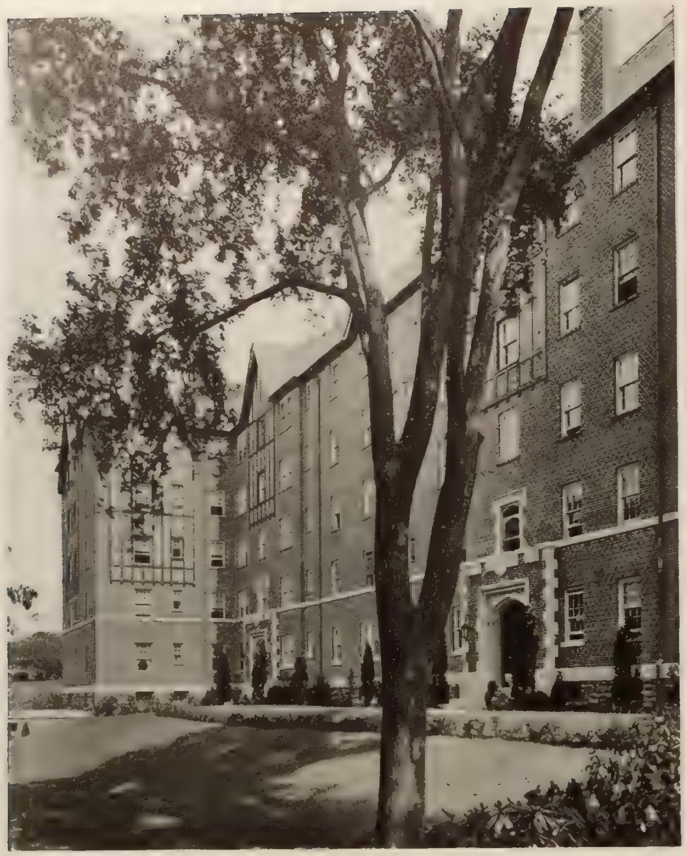
CO-OPERATIVE APARTMENT-HOUSES OF THE SMALLER TYPE.



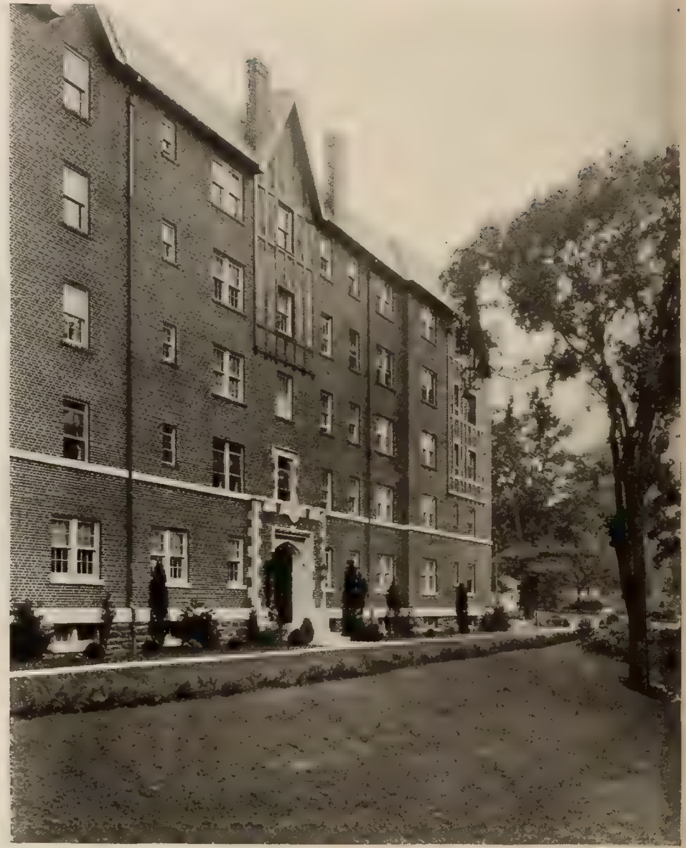
Street façade, Pelham Arms Apartments, Pelham Manor, N. Y.

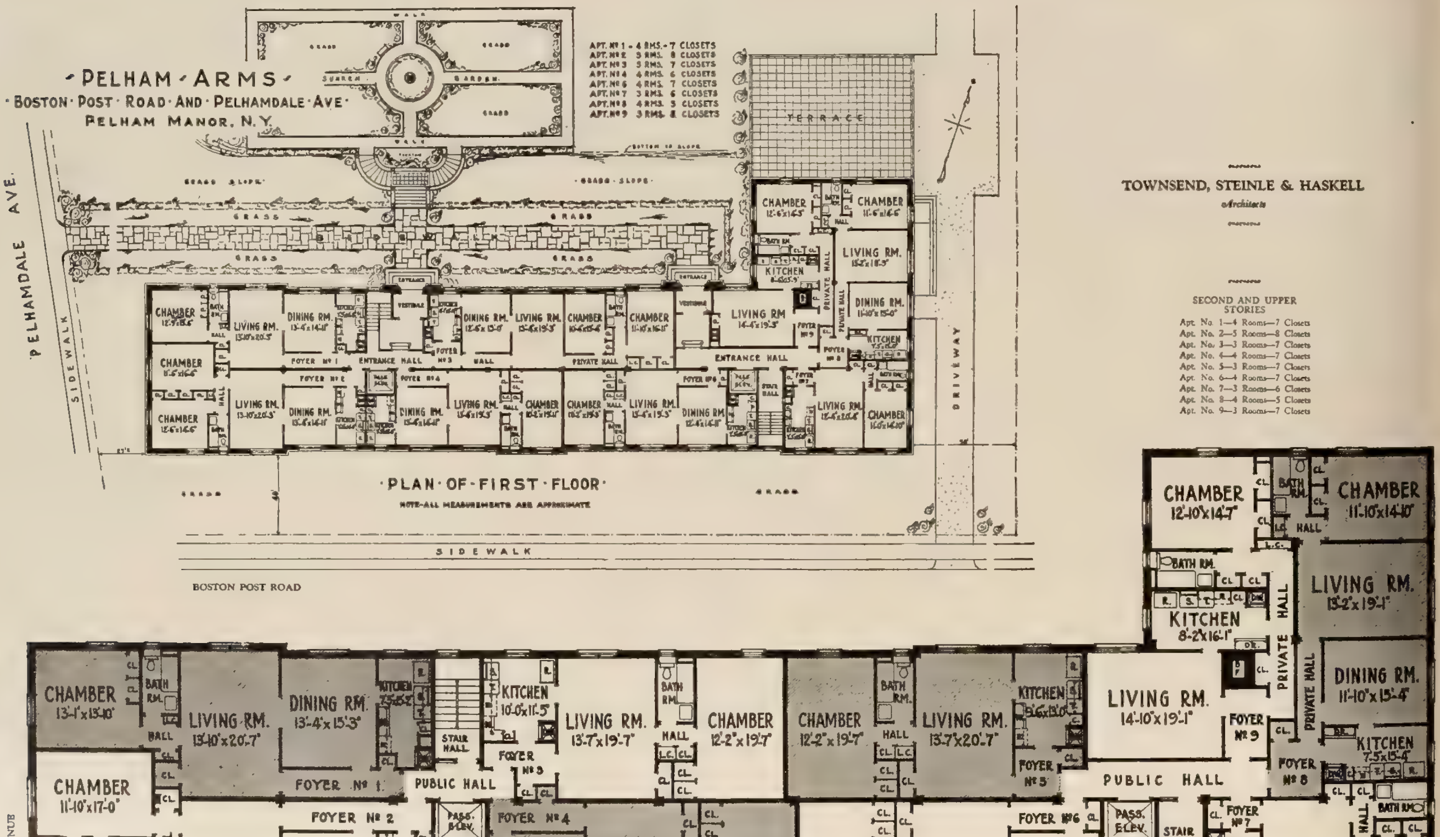
Townsend, Steinle & Haskell, Architects.

CO-OPERATIVE APARTMENT-HOUSES OF THE SMALLER TYPE.



From the garden.





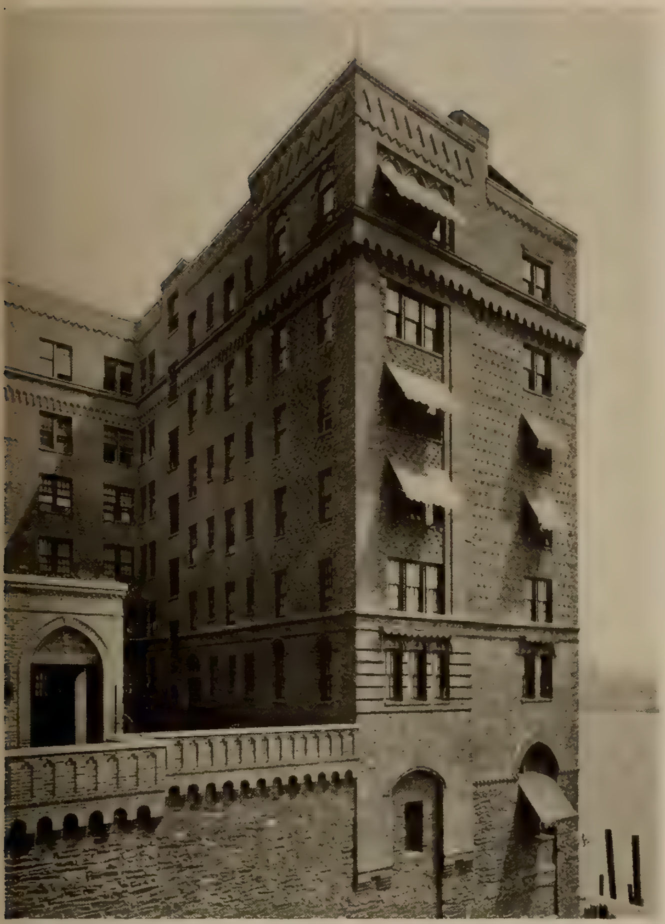
TOWNSEND, STEINLE & HASKELL
Architects

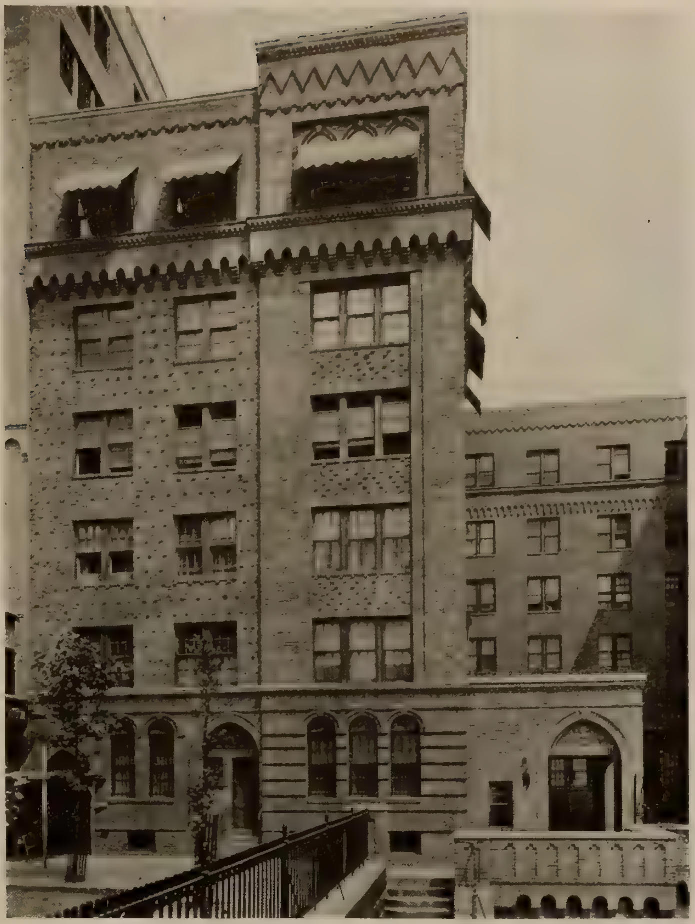
SECOND AND UPPER STORIES
Apt. No. 1—4 Rooms—7 Closets
Apt. No. 2—5 Rooms—8 Closets
Apt. No. 3—3 Rooms—7 Closets
Apt. No. 4—4 Rooms—7 Closets
Apt. No. 5—3 Rooms—7 Closets
Apt. No. 6—4 Rooms—7 Closets
Apt. No. 7—3 Rooms—6 Closets
Apt. No. 8—4 Rooms—5 Closets
Apt. No. 9—3 Rooms—7 Closets

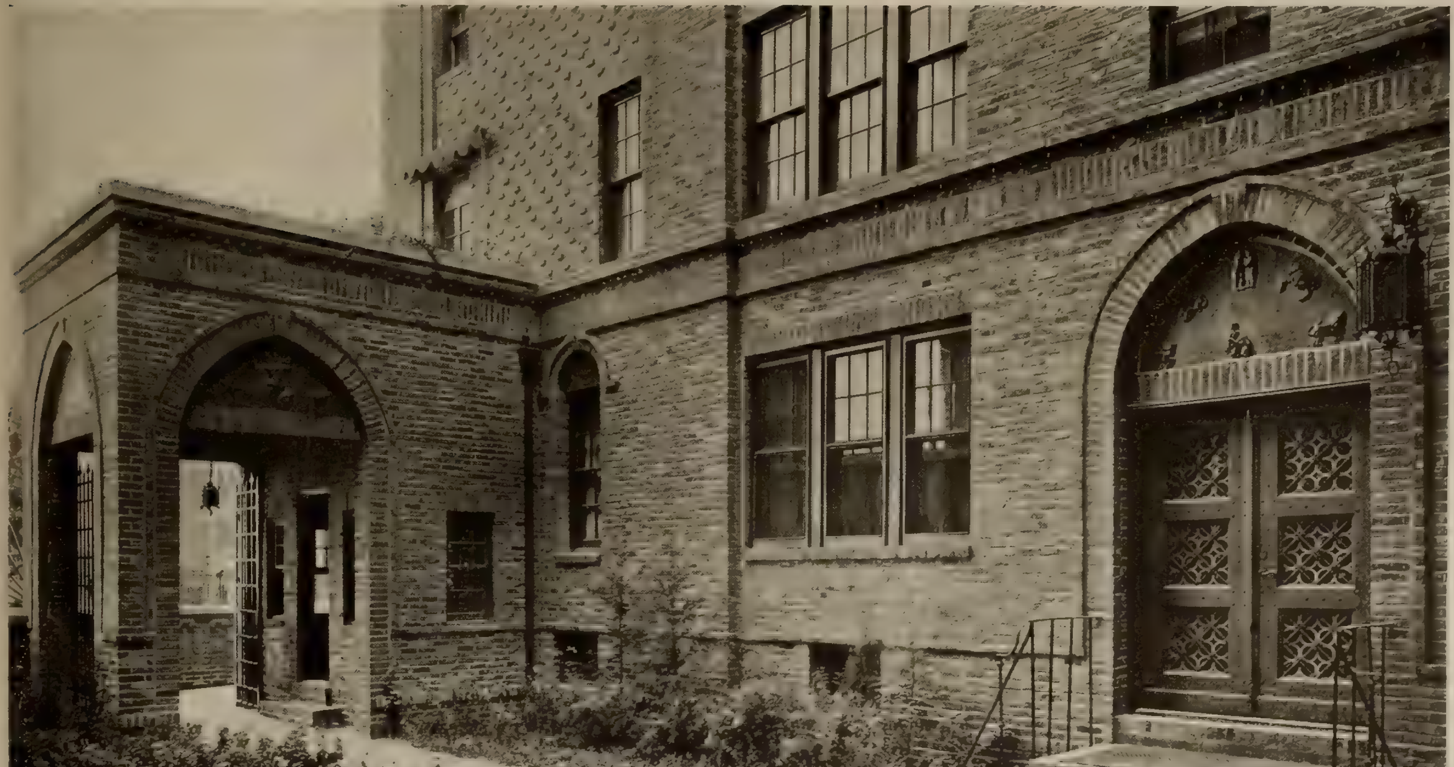
OF TYPICAL FLOOR

Pelham Arms Apartments, Pelham Manor, N. Y. Townsend, Steinle & Haskell, Architects.

CO-OPERATIVE APARTMENT-HOUSES OF THE SMALLER TYPE.

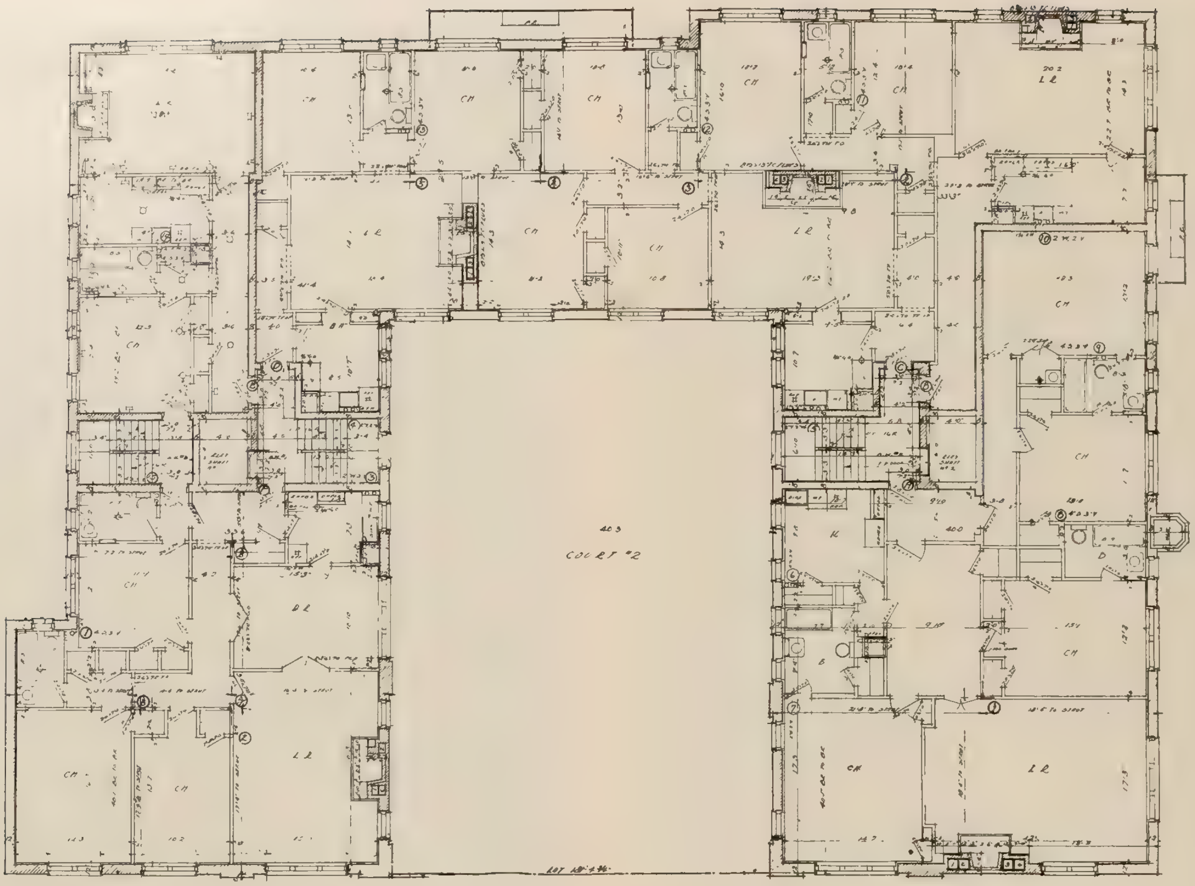




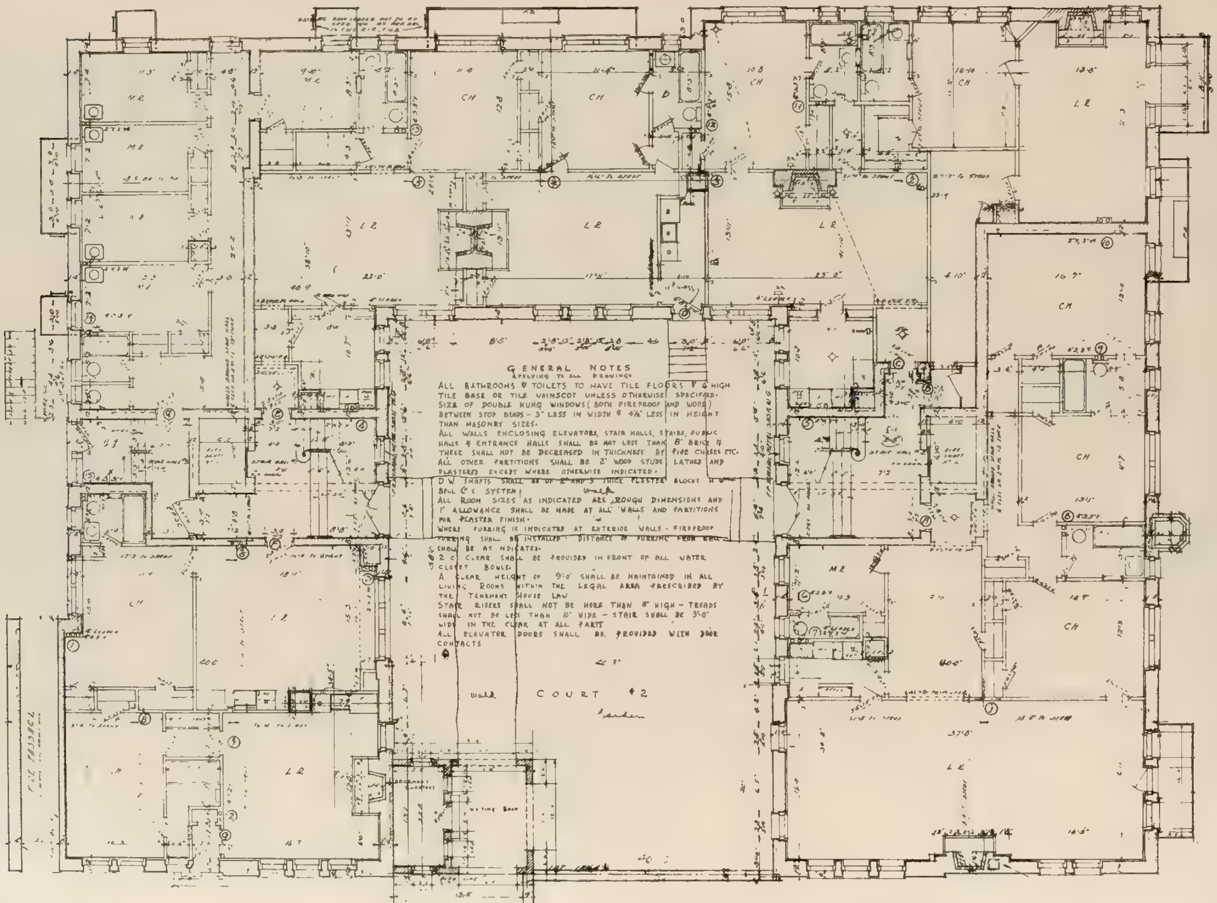


Beekman Terrace Apartments, New York. Treanor & Fatio, Architects.

CO-OPERATIVE APARTMENT-HOUSES OF THE SMALLER TYPE.

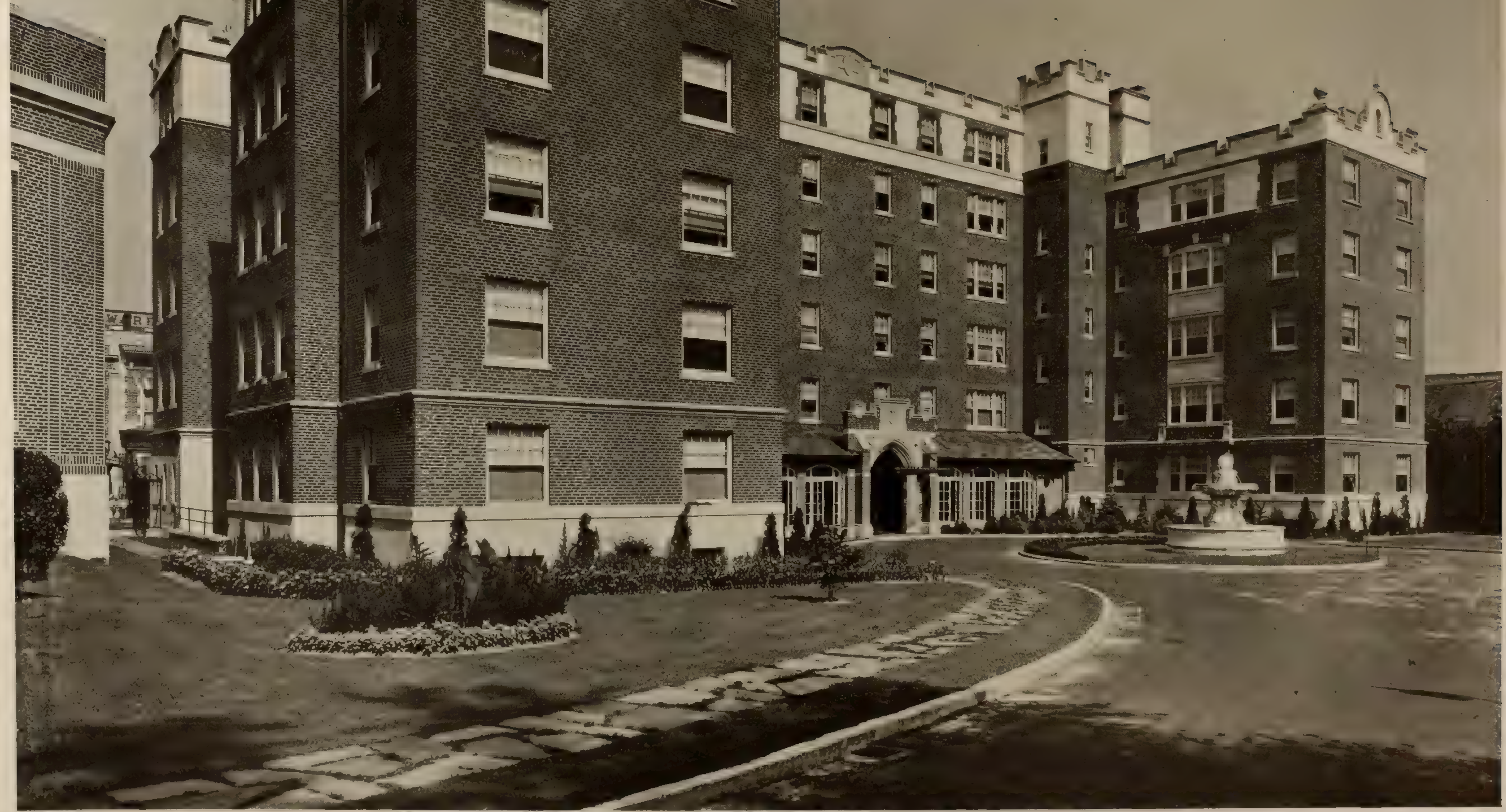


Typical floor plan.


GENERAL NOTES
APPLYING TO ALL DRAWINGS
ALL BATHROOMS & TOILETS TO HAVE TILE FLOORS & 6" HIGH TILE BASE OR TILE WAINSCOT UNLESS OTHERWISE SPECIFIED.
SIZE OF DOUBLE HUNG WINDOWS (BOTH FIREPROOF AND WOOD) BETWEEN STOP BEADS – 3" LESS IN WIDTH & 4½" LESS IN HEIGHT THAN MASONRY SIZES.
ALL WALLS ENCLOSING ELEVATORS, STAIR HALLS, STAIRS, PUBLIC HALLS & ENTRANCE HALLS SHALL BE NOT LESS THAN 8" BRICK & THESE SHALL NOT BE DECREASED IN THICKNESS BY PIPE CHASES ETC.
ALL OTHER PARTITIONS SHALL BE 2" WOOD STUDS LATHED AND PLASTERED EXCEPT WHERE OTHERWISE INDICATED.
D W SHAFTS SHALL BE OF 2" AND 3" THICK PLASTER BLOCKS BELL C°'S SYSTEM.
ALL ROOM SIZES AS INDICATED ARE ROUGH DIMENSIONS AND 1" ALLOWANCE SHALL BE MADE AT ALL WALLS AND PARTITIONS FOR PLASTER FINISH.
WHERE FURRING IS INDICATED AT EXTERIOR WALLS – FIREPROOF FURRING SHALL BE INSTALLED. DISTANCE OF FURRING FROM WALL SHALL BE AS INDICATED.
2'0" CLEAR SHALL BE PROVIDED IN FRONT OF ALL WATER CLOSET BOWLS.
A CLEAR HEIGHT OF 9'0" SHALL BE MAINTAINED IN ALL LIVING ROOMS WITHIN THE LEGAL AREA PRESCRIBED BY THE TENEMENT HOUSE LAW
STAIR RISERS SHALL NOT BE MORE THAN 8" HIGH – TREADS SHALL NOT BE LESS THAN 10" WIDE – STAIR SHALL BE 3'0" WIDE IN THE CLEAR AT ALL PARTS
ALL ELEVATOR DOORS SHALL BE PROVIDED WITH DOOR CONTACTS

Beekman Terrace Apartments, New York. Treanor & Fatio, Architects.

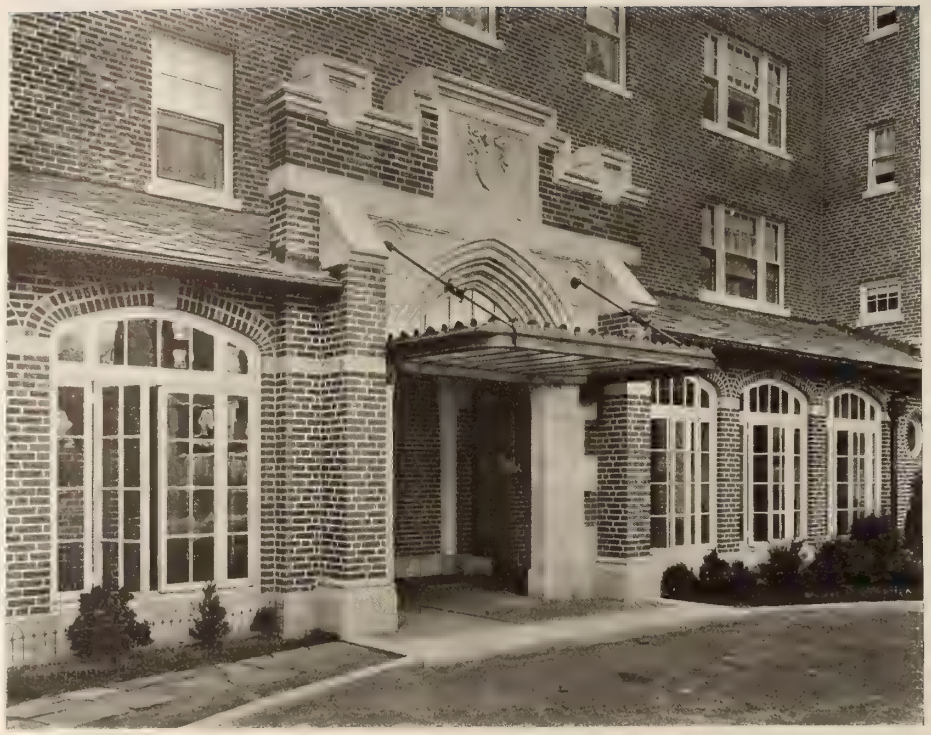
CO-OPERATIVE APARTMENT-HOUSES OF THE SMALLER TYPE



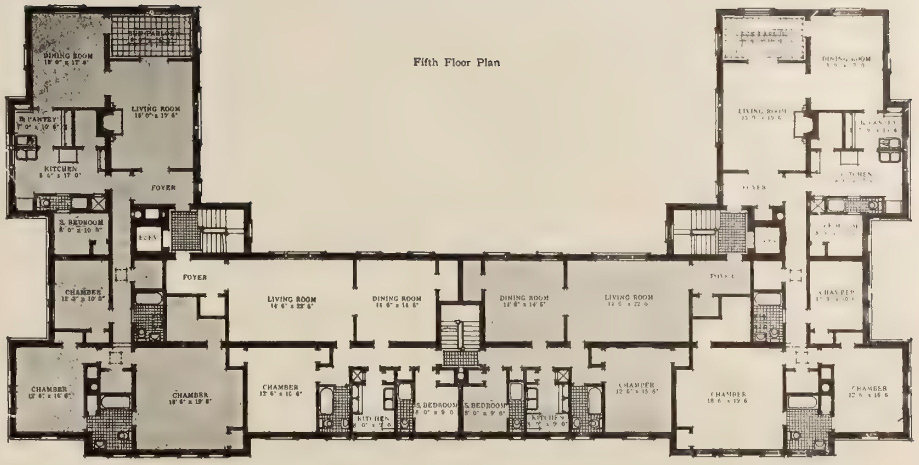
Albee Court, Larchmont, N. Y.

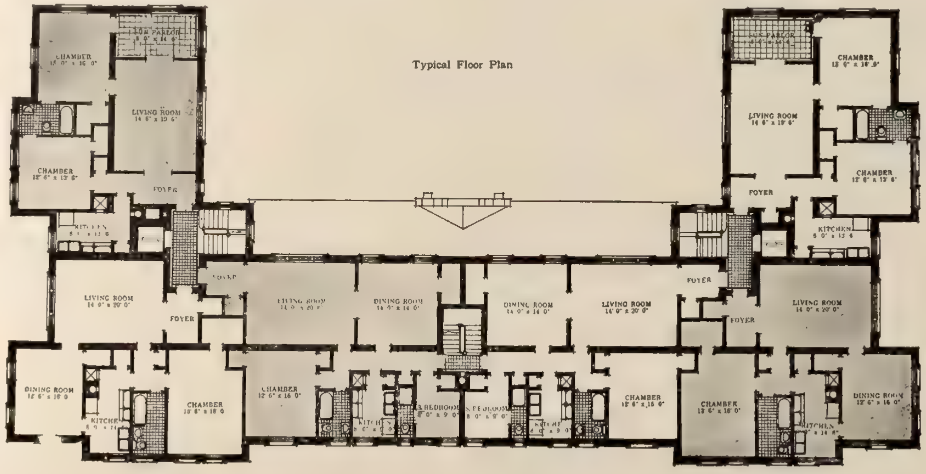
Frank A. Moore, Architect.

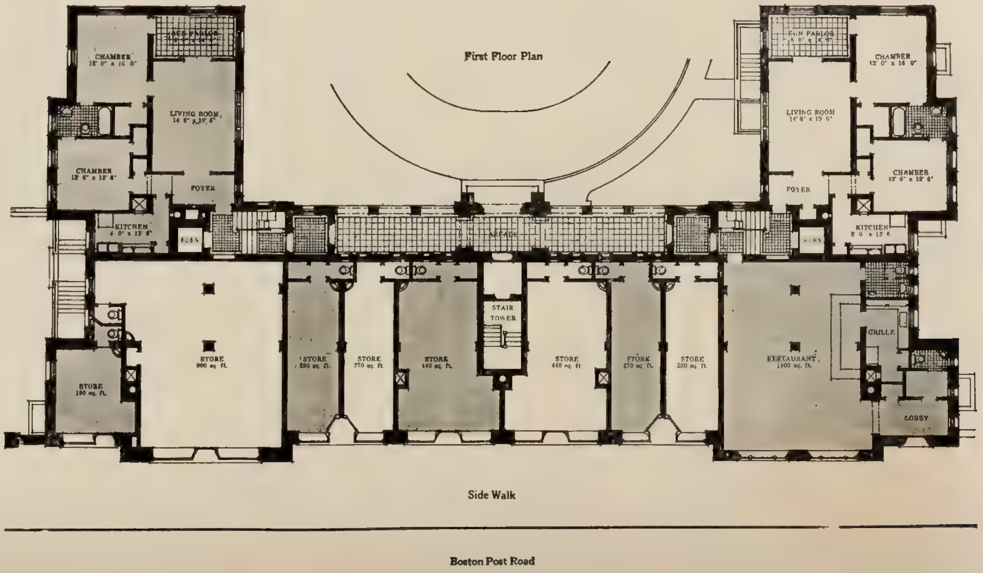
CO-OPERATIVE APARTMENT-HOUSES OF THE SMALLER TYPE.



Entrance detail.



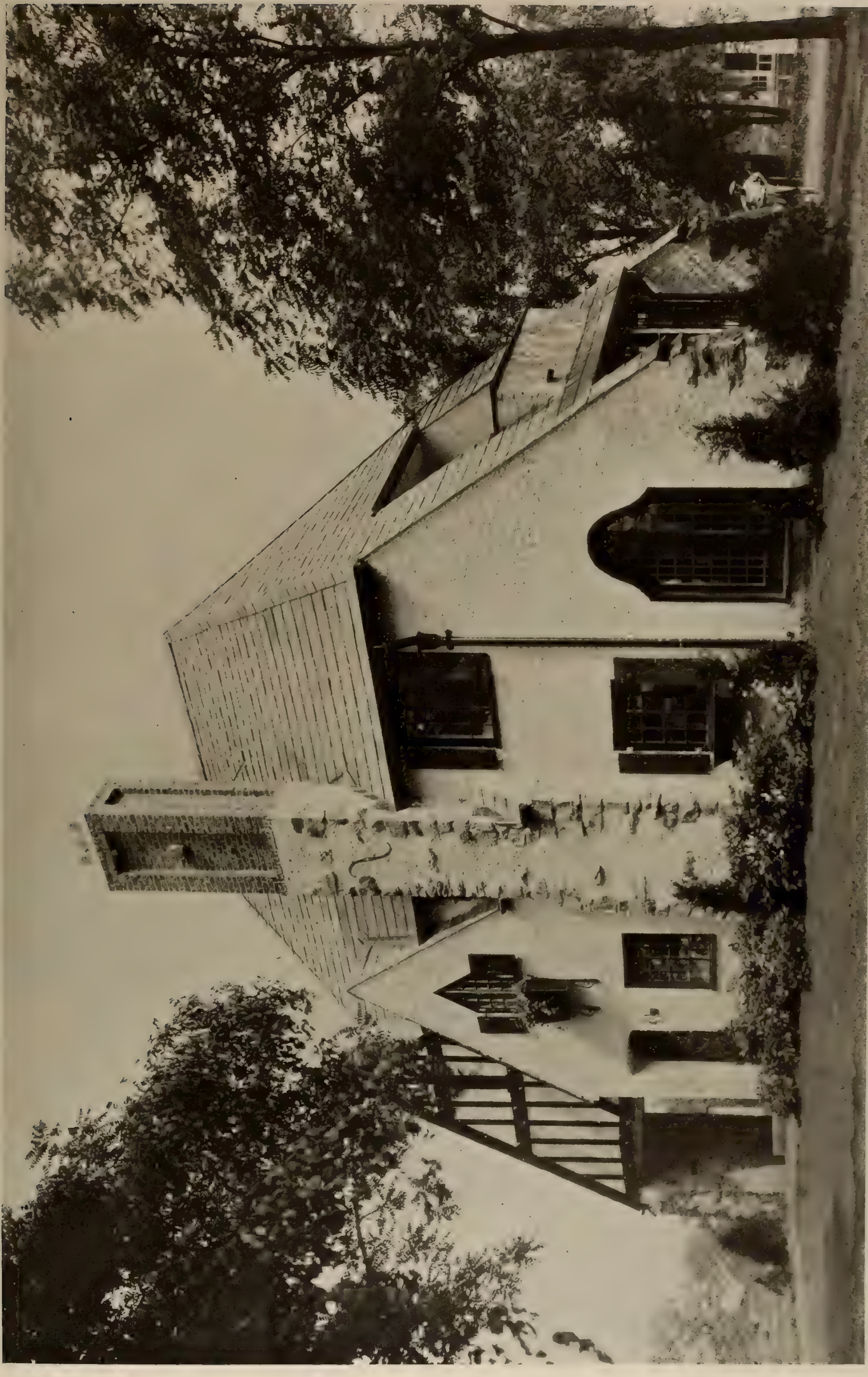




Albee Court Apartments, Larchmont, N. Y.

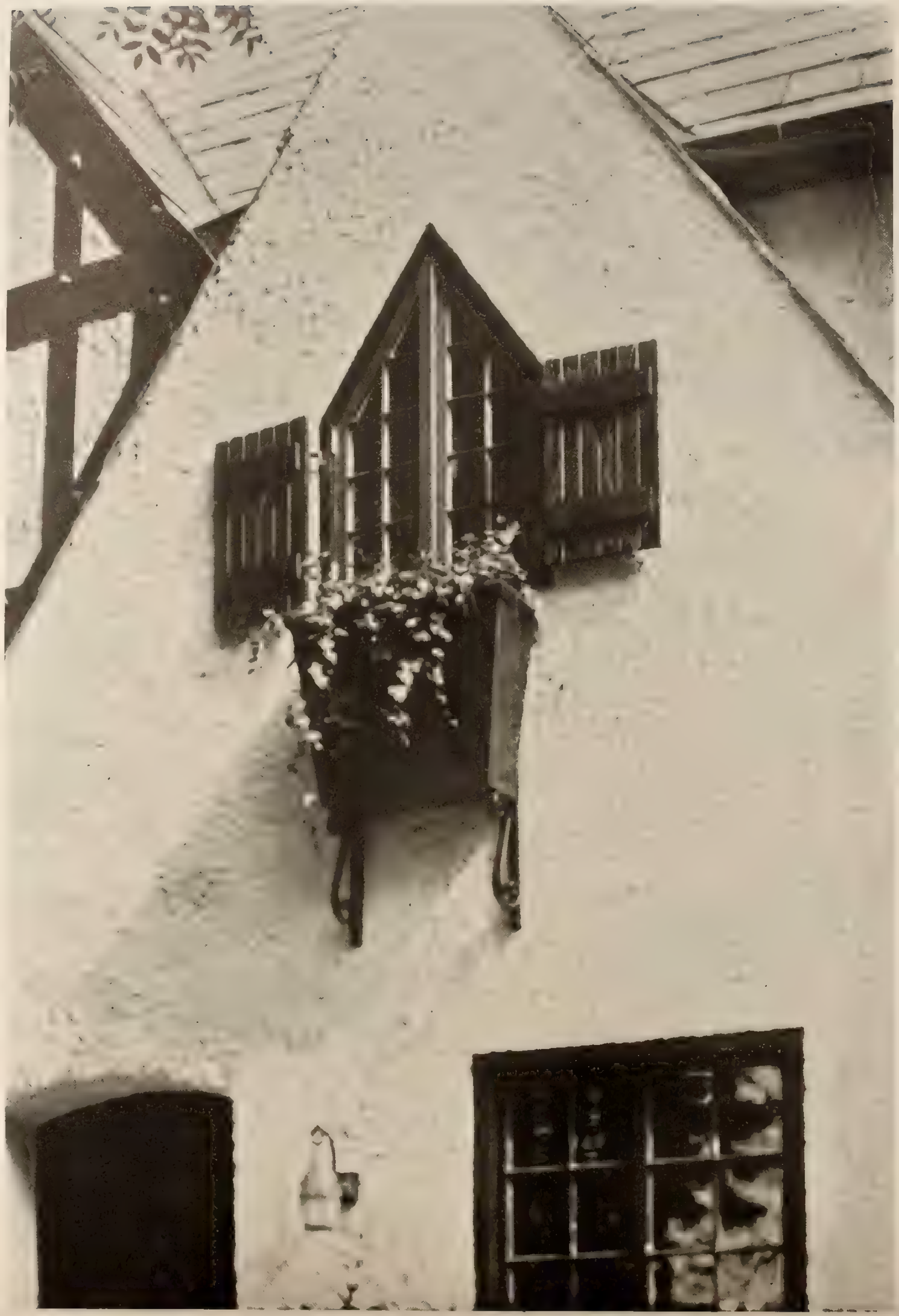
Frank A. Moore, Architect.

CO-OPERATIVE APARTMENT-HOUSES OF THE SMALLER TYPE.

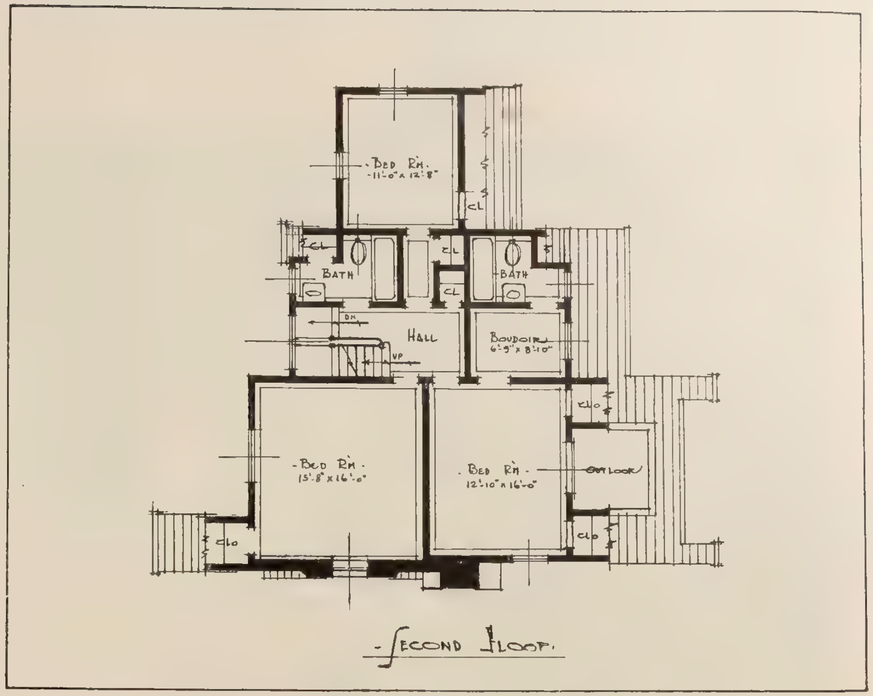


HOUSE, GENE SARAZEN, BRONXVILLE, N. Y.

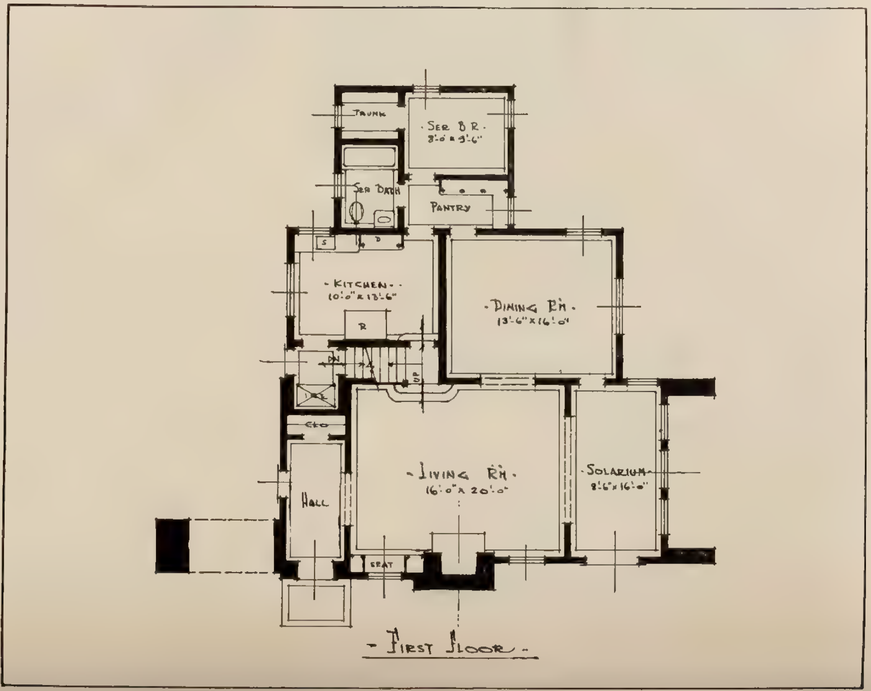
D. A. Summo, Architect.



DETAIL, HOUSE, GENE SARAZEN, BRONXVILLE, N. Y.

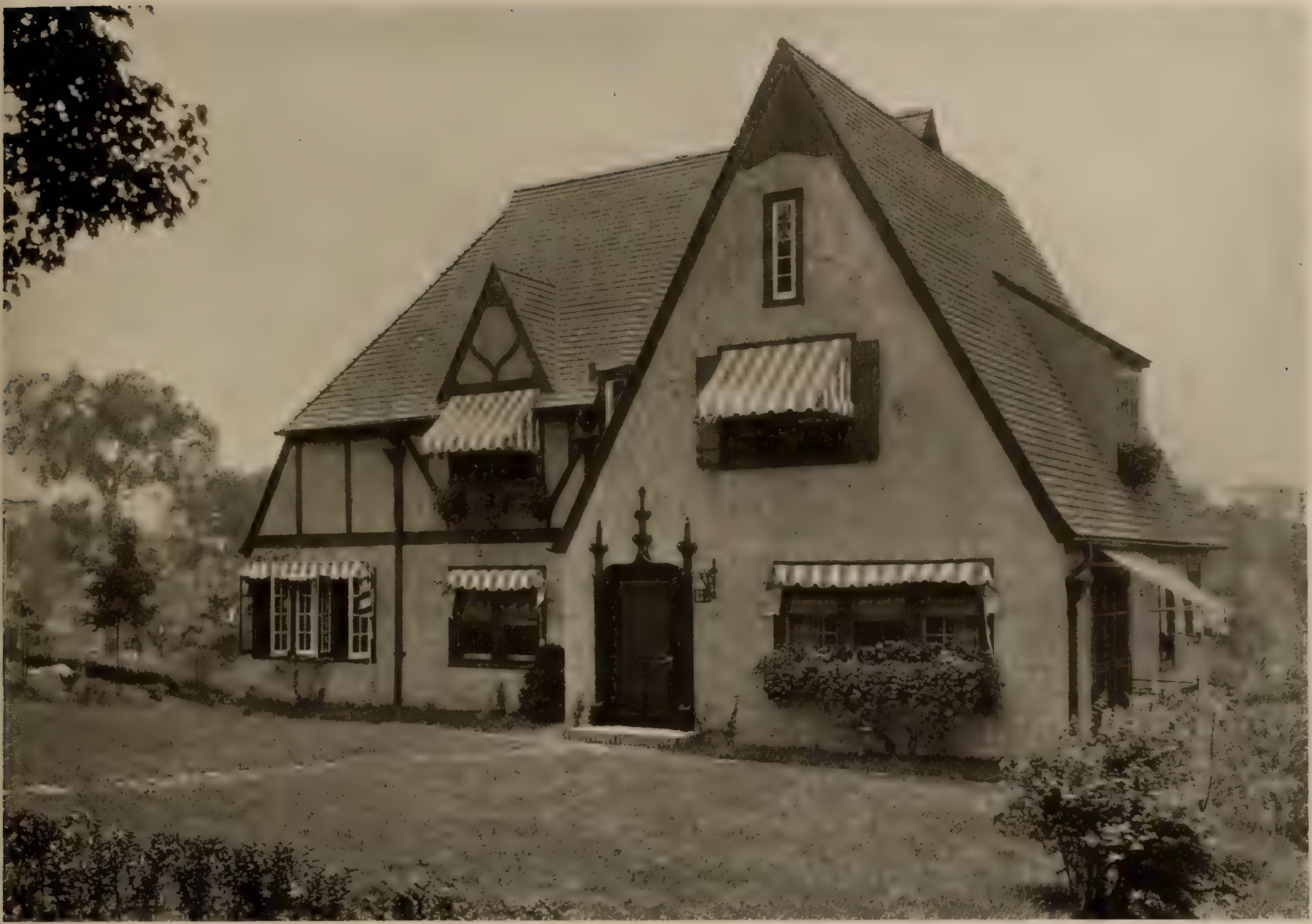


- Bed Rm. - 11'-0" x 12'-8"
CL
CL
Bath
CL
CL
Bath
DN
Hall
Boudoir
6'-9" x 8'-10"
UP
Clo
- Bed Rm. - 15'-8" x 16'-0"
Bed Rm. - 12'-10" x 16'-0"
Outlook
Clo
Clo
- Second Floor.

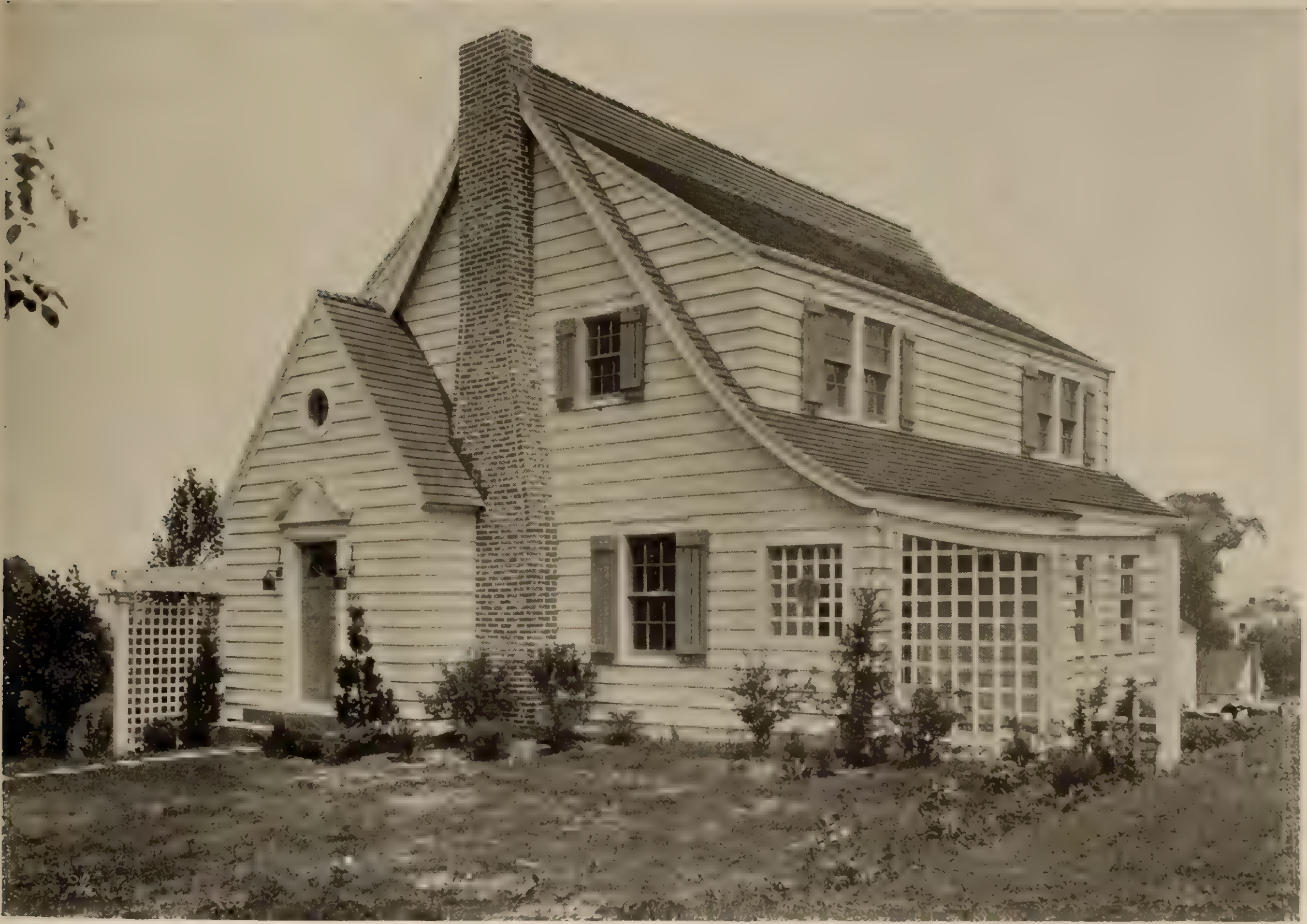


Trunk
- Ser B R. - 8'-0" x 9'-6"
Ser Bath
Pantry
S
D
- Kitchen - - 10'-0" x 13'-6"
R
- Dining Rm. - 13'-6" x 16'-0"
DN
Clo
- Living Rm. - 16'-0" x 20'-0"
- Solarium - 8'-6" x 16'-0"
Hall
Seat
- First Floor -

D. A. Summo, Architect.

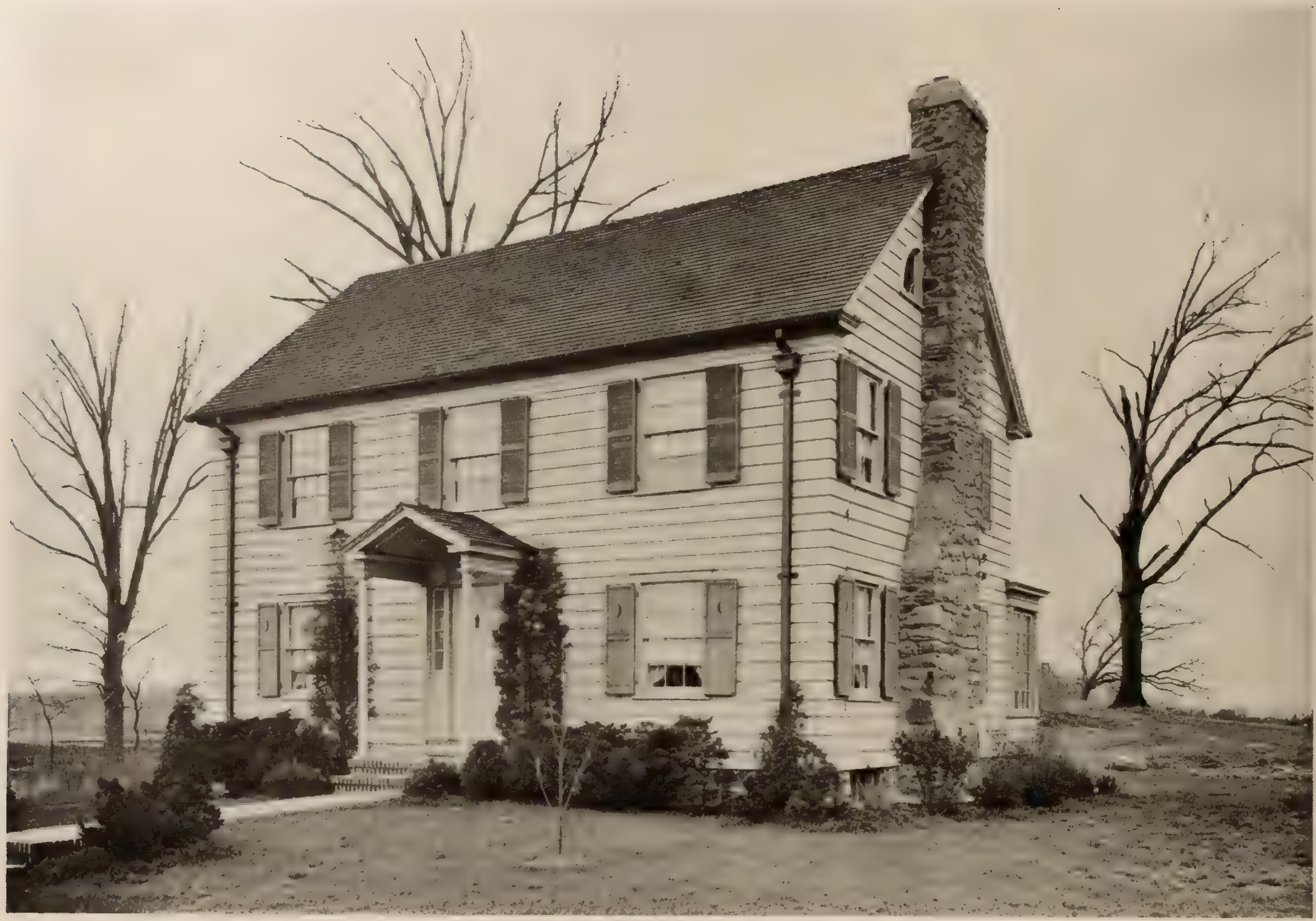


A house at Stamford, Conn.

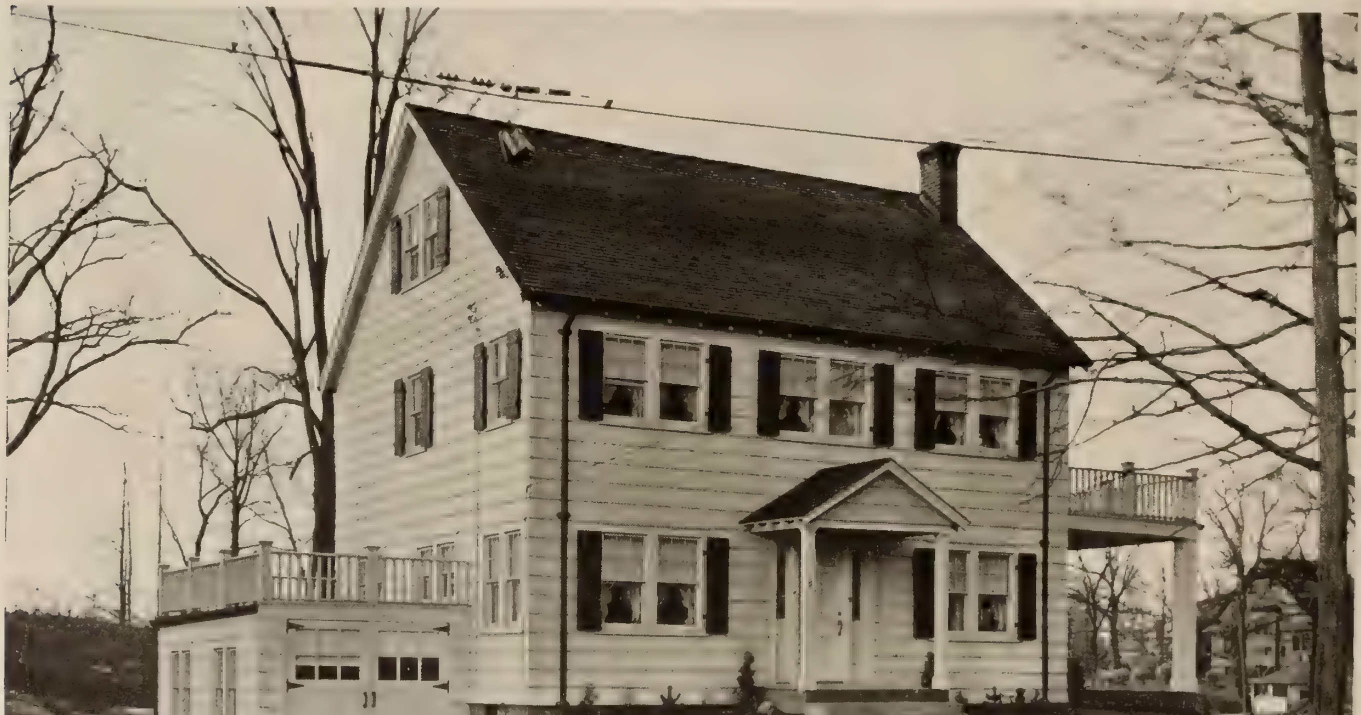


A house at Stamford, Conn.

SMALL HOUSES IN SUBURBAN TOWNS.

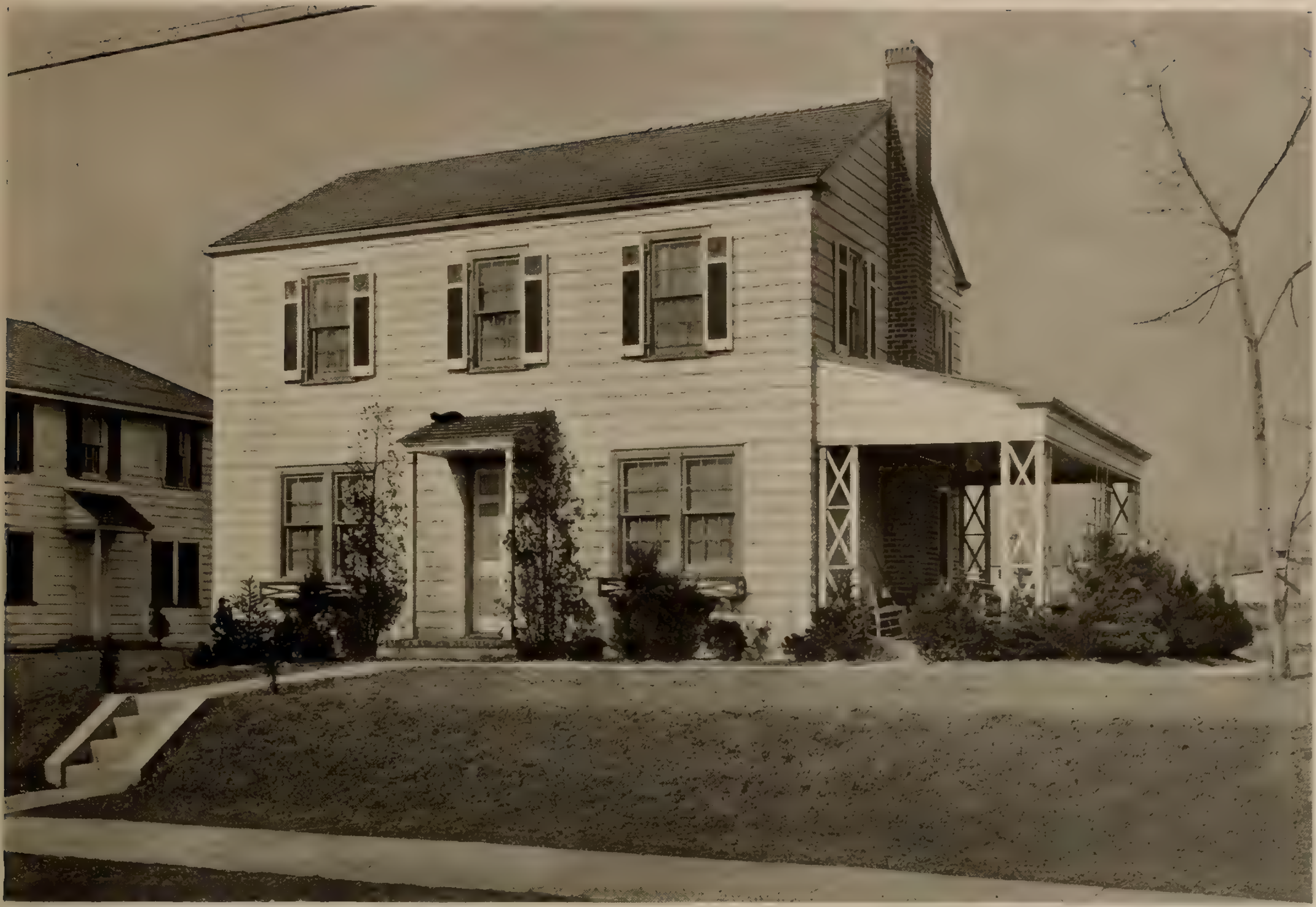


A house at Larchmont, N. Y.

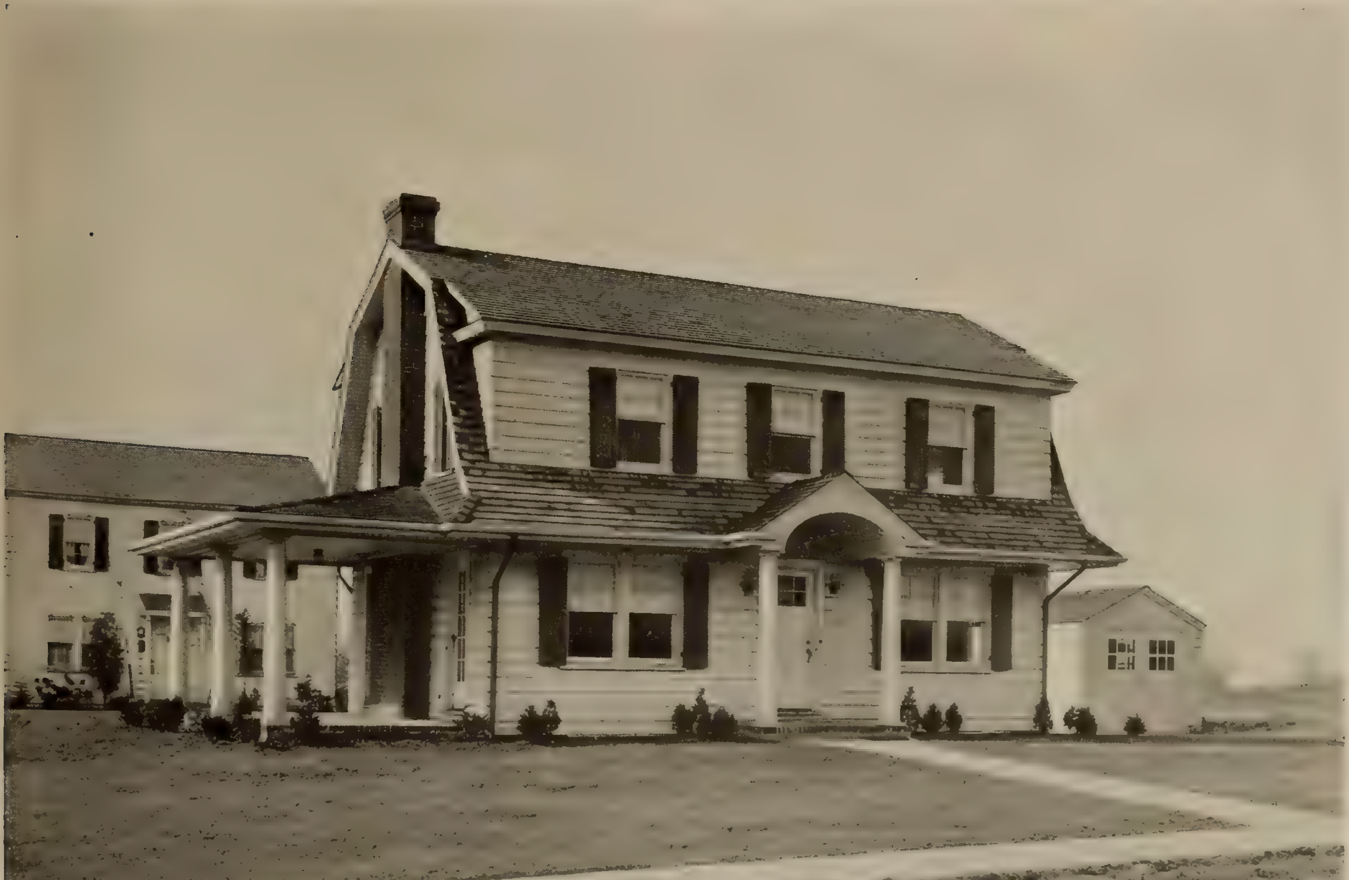


A house at Larchmont, N. Y.

SMALL HOUSES IN SUBURBAN TOWNS.

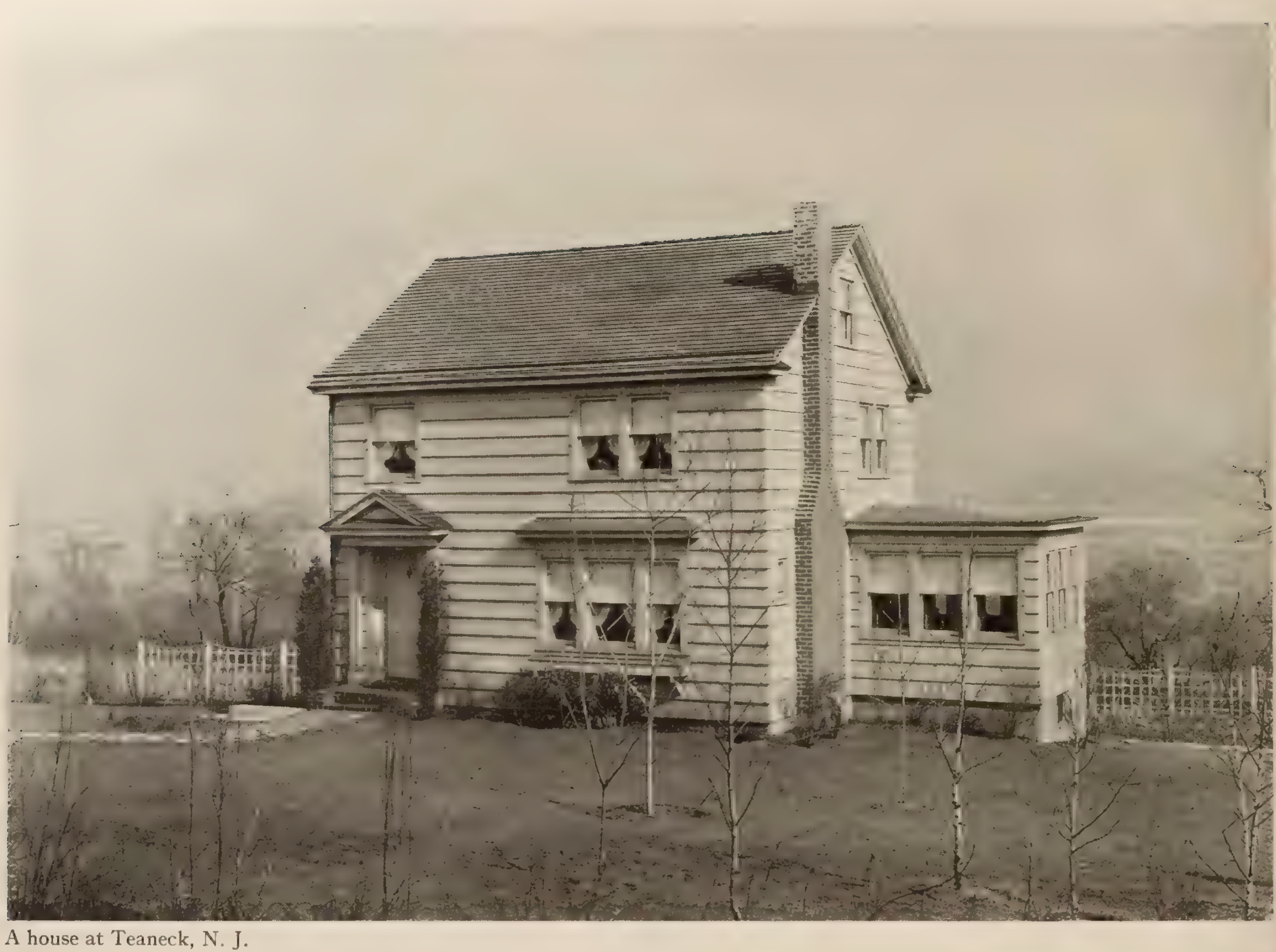


A house at Phelps Manor, N. J.

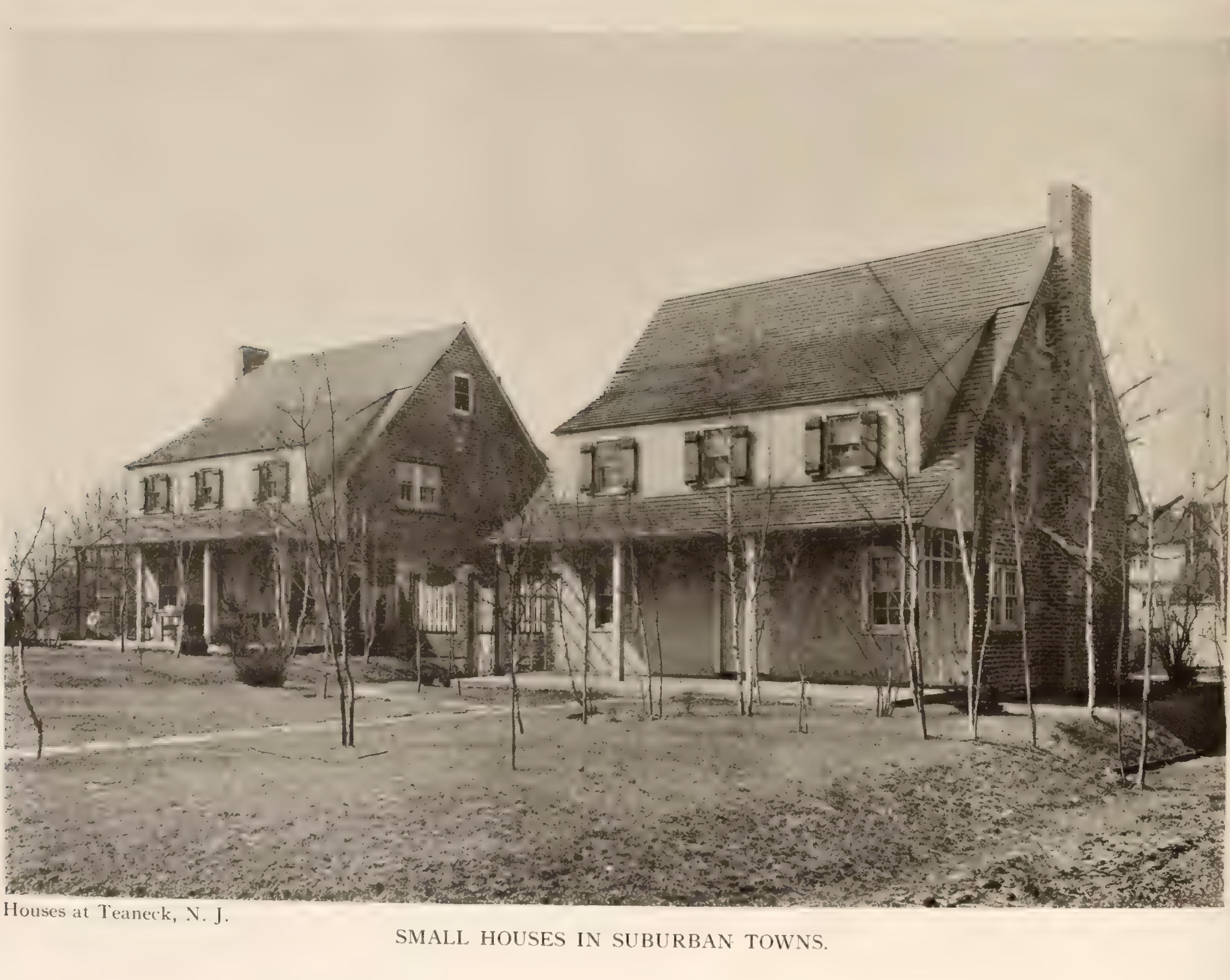


A house at Phelps Manor, N. J.

SMALL HOUSES IN SUBURBAN TOWNS.



A house at Teaneck, N. J.



Houses at Teaneck, N. J.

SMALL HOUSES IN SUBURBAN TOWNS.

Book Reviews

BERTRAM GROSVENOR GOODHUE—ARCHITECT AND MASTER OF MANY ARTS. The Text by HARTLEY BURR ALEXANDER, RALPH ADAMS CRAM, GEORGE ELLERY HALE, LEE LAWRIE, C. HOWARD WALKER, CHARLES HARRIS WHITAKER. Edited by CHARLES HARRIS WHITAKER. Press of the American Institute of Architects, Inc., New York City.

In looking through this beautiful book we cannot but feel that Mr. Goodhue would have found pleasure in it merely as a specimen of one of the arts in which he was always deeply interested. It has been compiled with a regard for the things that best manifested his many-sided genius, and with a loving care only possible in those who knew him and the great place he held in his chosen profession. Some day, maybe, we shall have a more definitive and inclusive biography, but for the present this volume covers all essentials, and in text and illustrations expresses both the personality and the art of the man.

SLEEPE·AFTER·TOILE·PORTE·AFTER
STORMIE·SEAS·EASE·AFTER·WARRE
DEATH·AFTER·LIFE·DOTH·GREATLIE·PLEASE

In Mr. Whitaker's introductory biographical sketch he tells us that Mr. Goodhue was born in Pomfret, Conn. "His family history flows along with the history of Pomfret without a break, and its members had much to do with its affairs." He was born in 1869. "Those who remember Bertram Goodhue in boyhood recall his love for the woods, which were then distributed in such splendor over the magnificent hills that there abound. To angling he took with a fervor that never left him, but long days spent in the woods at all seasons found him with a pad and pencil, and his especial fondness, as Mr. Hoppin, one of his boyhood companions on these excursions, recalls, was the long contemplation of the trees, slim-standing in their tapestry of light and shadow, and with their arched and foliaged splendor meeting high above."

A dreamer and a lover of the beautiful with a natural talent for drawing and a sense of the pictorial. Of schooling in the conventional ways he had but little, but better than any teaching was his avid search in books of all kinds for the things that gratified his spiritual needs, and taught him the things that he needed toward directing his mind along the ways of the profession he had declared he would follow. The two years he spent at the Russell Collegiate Institute in New Haven were largely spent "in drawing dream cities or in caricaturing his fellow students." Happy and fortunate boy to be permitted to grow within himself. "His impressionable mind had no need of what is called education in the school sense, and it is very likely that his true genius took seed and blossomed and bore a fruit that might have been less to the taste had that genius been interfered with by pedantry or academicism."

Always a student, "his mastery of the arts was not merely the manifestation of a divine gift that flowed on without effort. He sought and studied, read and remembered, and there is no piece of his work, in any field, that is not imbued with as much knowledge as skill."

His first experience in an architect's office was with Renwick, Aspinwall & Tucker, in New York, a firm still in existence. Here he made an immediate impression, and in a few years he was widely known as a designer of unusual distinction. "He was an extraordinarily hard-working young draftsman."

The story of his going to Boston, later to become a partner in the firm of Cram, Goodhue & Ferguson, is told in an article by Mr. Cram:

"No more engaging youth could have put in an appearance. Blond, slender, debonair, with a 'school-girl complexion,' and a native grace of carriage, he presented a personality made up of joy of life, fantastic humor, whimsical fads and fancies, blended with a dominating ambition, an incomparable sense of beauty, an abounding friendliness, and a capacity for hard work that nothing could daunt. Already, though he had hardly more than attained his majority, he revealed an incomparable sense of ornament and architectural detail, while in some way or other he had made himself a not unworthy rival of Raffles Davidson in pen-and-ink rendering. With it all were a naïveté and a boyishness that were lasting joys."

Of Mr. Goodhue's place in his profession, Mr. Cram says:

"Not only was Bertram Goodhue a very great genius in his own right as a creative artist, he was also a dynamic source of immense inspiration. His personality was such that it drew out of all with whom he came in contact all that was potential in them, and even seemed to instil into each one something that was not there before. This was true of his associates, whether partners or draftsmen, and of those kindred spirits outside architecture of whom I have spoken. Nor was this in the least a conscious action on his part. No one was ever less a propagandist or wilful educator; this sort of thing he looked on rather with disdain. Yet—he remains one of the great educational agencies in American architecture, for I suppose there are more successful practitioners to-day who owe their inspiration to him than hold in the case of almost any other American architect, except one or two of his immediate predecessors. What he was and what he accomplished are a lasting testimony to the creative force of personality, for in the end it comes down to this, that in a day of low averages here was a personal quality and force that stood out clear, definite, and brilliant, with but few peers in his own day and generation."

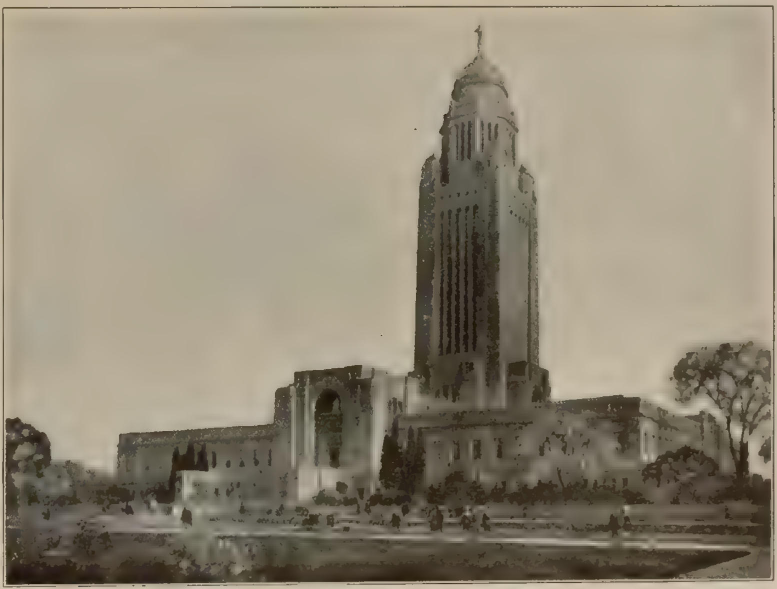
C. Howard Walker says: "His genius was Protean; it took many forms and it graced them all."

How true is the following as applied to the author's own work. It is an extract from comments written by Mr. Goodhue, and quoted in Mr. Whitaker's sketch:

"But, after all, Mediæval Gothic, the Gothic of the cathedrals to which I have referred, and Modern Gothic, the Gothic of such churches as are being built now all over England and America, are two very distinct things. Mediæval Gothic is now impossible and must remain mediæval, and the Gothic we do to-day, if it is to be vital, and beautiful, and true, and good, and therefore Art, must be of our own times. I don't mean by this that we must abandon all the old ideals or any of the old materials. Steel-framing and reinforced concrete are good enough things in their way when properly used as the servants of the architect, but just because we have such materials is no reason why we should throw away stone, and oak, and carving, and metal work, and stained glass. We may not actually imitate the masterpieces of old; we would have to be of the times that created them to do that, but we may retain all that we worthily can of their underlying spirit. . . ."

If the impressions of the various contributors to the volume help us to better understand the man, to realize the charm and inspiring character of his personality, a glance through the numerous plates manifests his many-sided interests in the arts, and reveals his genius as it broadened and developed beyond any merely academic limits into such a vital outstanding and daring achievement as the Nebraska State Capitol. Mr. Alexander says of this:

"It is beyond question that there is a powerful element of free imagination in this Goodhue conception, and that herein lies the secret of its vitality. The very fact that the designer entered the competition only with some persuasion and with little expectation of success, and that he approached "the Nebraska thing"—as he playfully called it—with a certain unconcern, this attitude in itself gave him conscious emancipation. Beyond this lay the unlimited nature of the field: a checker-board town in a section-line country, virtually flat, which, if they were to be adorned at all, must be adorned by the hand of man; a public with no architectural prepossessions; a client who could but accept or decline without suggestion; a theme that in its nature called for outward majesty. It was an ideal opportunity for imaginative daring, and it was seized upon."


Nebraska State Capitol, Lincoln, Neb.

Doctor Hale refers to Mr. Goodhue as a romanticist:

"I must add that I find a still stronger appeal in Goodhue the romanticist. One of his former associates, in the introduction to 'A Book of Architectural and Decorative Drawings by Bertram Grosvenor Goodhue,' truly describes him as 'a favored child of all the arts.' The range of his imagination carried him into so many territories that the present volume cannot begin to exhibit the spoil he brought home. Best and most characteristic of this booty is that captured from the castles and towns of his 'voyages imaginaires.'"

The Effect of Gravity on Building Construction

By H. Vandervoort Walsh

Professor of Construction, School of Architecture, Columbia University

Article II

THE REVERENCE OF OUR ANCESTORS FOR THE GREAT AND HEAVY STONE

The Temple of Karnak, in Egypt, showing the use of enormous stones, but very simple construction.

THERE is a living record of the way the ancient builders considered the action of gravity on the various units of their structure. We find it in the derivation of such words as weight, load, and force. Weight came from an Anglo-Saxon word meaning to lift, load from another word meaning to carry, and force from the Latin root *fortia* meaning muscular vigor and strength for combat. These words show that our ancestors did not make mental pictures of that invisible thing which we call the force of gravity, but that they thought only of the resistance of structural members to their physical efforts to move them. They were well aware of the muscular strength needed to raise building-stones to their place in the wall, but they did not ask questions how and why this was so. They appreciated the fact that the bigger the stone was, the more strength was required to raise it, and that some were so big that it took many men, and others were too big to be lifted at all.

This silent resistance of stones to the physical effort of man to move them made a deep mental impression on all of the oldest builders. They learned to respect big stones, for these hard blocks were stronger than they were. They credited them with animate powers of resistance. Walls constructed of them seemed to be mightier walls than those built of smaller ones. Gigantic statues, carved from one great stone, were very awe-inspiring to them. Monolithic columns and tall obelisks were held in reverence.

Now, all of the remains of buildings erected by the earliest races were built to honor their gods and kings, and the architects desired, above all, to impress the people with the strength of these mighty ones. Accordingly they built with great stones. If thousands of bleeding and sweating slaves were required to raise the huge blocks of marble or granite up into a building, that indicated the great power of the king who could command such human strength to overcome the sleeping giants in these stones. The same impression of awe is felt, even by us to-day, when we see their monuments. The great size and apparent permanence appeal to our sense of weight and power. We all have a sneaking belief that a race of giants once stalked the face of the earth, and perhaps these monuments were built by their hands. And that was the impression these old builders desired to give, for they wanted their gods and kings to be pictured as supermen. Thus, even in the carved pictures of the kings, appearing before their conquered enemies, they are shown to be two and three times larger than the captives who bow before them.

Wherever we go, throughout the world, the oldest races and civilizations have left us evidence of their love of great stones, which after all was reverence of their weight. In Cuzco, the capital city of the Inca empire and the oldest living city of South America (indeed, it can lay claim to being one of the oldest cities in the world), there are walls of extraordinary masonry, which show the work of three epochs. The oldest and lowest strata is built with huge polygonal stones cut and shaped to fit together like a cut-out puzzle, and laid with extreme care and accuracy. The strata above is built of squared stones of somewhat smaller size but still very big, and the top layer is but the flimsiest work of modern dwellings.

Stonehenge in the County of Wiltshire, England, built by prehistoric man.

Then there are the strange giant stones (one 67 feet high before it fell) of the megalithic builders of four thousand years ago near the village of Carnac in Brittany. Uncut and shaped as by Nature, they stand in long lines, the cause of much guessing concerning their original purpose. But certain we are that they were monuments of some kind, and they are evidence of man's primitive reverence for the great stone.

Likewise, there is the famous Stonehenge in the county of Wiltshire, England, where thirty enormous upright stones were placed by prehistoric man in a circle 100 feet in diameter and were capped by great lintel stones. In repairing the ruins, one of the lintel stones had to be moved, which required blocks, tackle, and derrick. If in modern times so much machinery was needed to move them, how tremendous a job it must have been for the original builders. There must have been a feeling of exhilaration in overcoming their weight, for even to-day the ponderous size of the stones stirs a responsive chord in the heart of the observer.

Other examples of megalithic monuments have been unearthed by archæologists on the gray island of Malta. A dozen or so temples built in the most primitive fashion have been found. But, although the plans and forms are crude, the builders have raised great stones for the supports and the lintels.

The abandoned stone in a quarry a half mile from the Temple of Bacchus at Baalbek.

Of course Egypt is full of buildings erected with great blocks of granite and sandstone. Tall obelisks 70 and 80 feet high, mammoth statues like those of Rameses II at the entrance of the great temple of Abu-Simbel, massive stone columns like those in the great hall of the temple of Karnak—all of these and many more are mute reminders of man's respect for the great stone that requires the combined physical effort of hundreds of men to move.

Then the Roman builders have left the same record. In the walls of the Acropolis at Baalbek are some of the largest stones ever moved by man. They are 64 feet long, 13 feet high, and 10 feet thick. In a quarry a half-mile away lies a stone even larger than these, as though it had been abandoned, its great weight having defeated the skill and strength of the builders. The great marble columns of the temple of Bacchus on the same site were brought from the interior of Egypt, a journey that must have required at least three years and untold suffering and toil.

Why did our ancestors struggle with such great stones when they could have built with smaller ones? Because they had a tremendous sense of the power of resistance of great monoliths, and this sense struck awe into their hearts when they saw a monument built of them, and as they were building for their mighty ones they constructed in the mightiest way they knew. Their buildings were monuments of sacrifice of human toil, blood, and death offered up in the memory of their kings and to honor their gods.

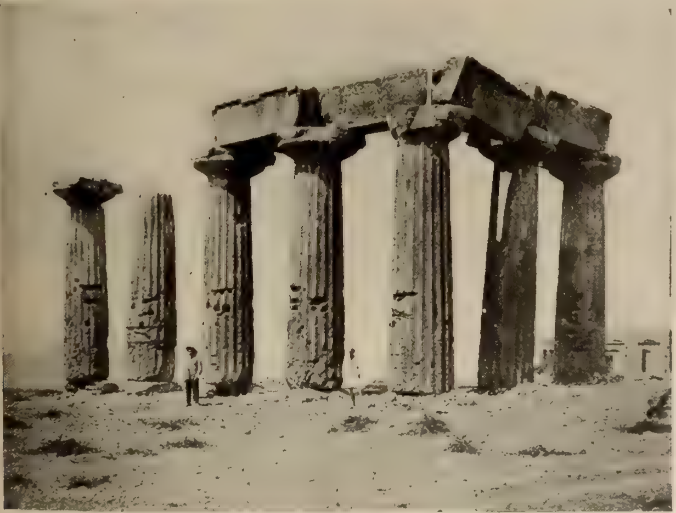
They knew the force of gravity in terms, not of weight and pounds, but in terms of aching backs, broken legs, and arms, crushed ribs, bleeding hands, and exhausted muscles.

But gradually machines were developed to move great weights, and practical builders grew less respectful of the large stones. The same glory in lifting them was no longer theirs, and so they began to count the cost. Little by little they cut off a part here and there of a column or a lintel, and found that the smaller sizes were strong enough for the work. Thus when they were better able to use the big building units, they lost their interest in them, and began to turn their attention to other matters. We to-day can appreciate that point of view, for we have engines and machines for lifting blocks of stone so big that our ancestors would have gasped in wonder, and yet we do not build with them; for since we are able to do it there is no marvel in it for us. We look at construction in a matter-of-fact way, counting the cost, and decide that small units are cheaper to build with. Nor are we laboring under the illusion which spurred on our fathers, that we must build for eternity, because we have the ruins of too many cities to teach us the futility of it.

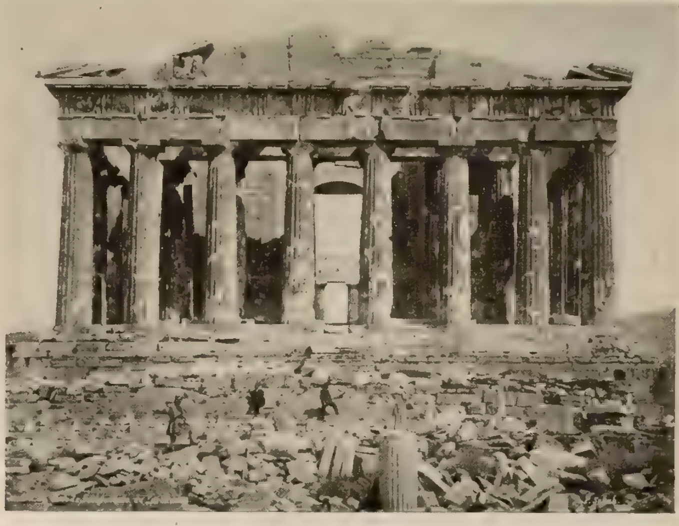
The historical classification of architecture shows this trend of feeling. The early Greek temples were massive and heavy as compared with the later ones, which were delicate and refined. Compared with the older Egyptian temples, they seem almost to be fragile. But the interest of the Greek architect was centred not upon size but upon beauty and fine proportion. These were intellectual matters and did not appeal to the physical prowess of man.

Another trend of the builder's mind was his growing interest in the balancing of his building-blocks, so he took delight in making the very force that caused his blocks to fall serve to hold up the building. The simple arch and vault was his beginning. Through long years of experience and failures builders became so expert in the art of juggling blocks that the cathedrals of the Middle Ages became a reality. These great churches were the antipodes in construction of the old temples of Egypt. The cathedrals were built with small stones beautifully balanced across arches and vaults, whereas the Egyptian temples are built of heavy stones laid upon columns in the simplest possible way. The cathedrals suggest the directing control of the mind over the art of block-building, but the temples of Egypt suggest the mastery of the brute over great building-stones.

After all, the progress of the art of construction represents an increasing knowledge of that force we call gravity. The oldest builders respected it as something that resisted their physical strength, and so they gloried in overcoming it. They noticed that the bigger stones remained in position better than the little ones. They learned that when blocks were piled on top of each other to build a wall, the higher the wall was raised the easier it fell over, and they



The Temple of Apollo at Corinth. Note how much heavier are the stones than in the more refined Parthenon.



West end of Parthenon, at Athens. Compare the small size of stones with the big ones in the Egyptian Temple of Karnak.

The Temple of Kaffra, Egypt.

made similar observations while building towers and columns. Failures and repeated trials proved to them that they could build higher if they would slope the walls, towers, and columns inward at the top. Thus the very model of permanent construction was the Egyptian pyramid, with its great base and sloping sides. Likewise the walls of the temples and pylons were battered inward for strength. Columns, too, were made thinner at the top than the bottom.

This is but a recognition of that repose of all objects gripped in the hands of gravity, for the mountains and the hills have wider bases than tops. The drifts of the sands of the desert have their angle of repose. Man learns to spread his legs when he desires to be firm. The trunks of the sturdiest pine-trees are greater at the base than at the top. Indeed, all things in nature show us the law that if we desire to build high with building-blocks the base must grow in proportion to the height.

But as common and basic as was this observation, no one asked the question how it happened thus. The ancient builders accepted it without being curious concerning the reasons. They learned from experience that a building needed a base that was level and columns and walls that were vertical. The lakes and the ponds and their own sense of balance told them of the horizontal. Hanging ropes and vines and standing men told them of the vertical. They were satisfied with that. In their minds was no abstract conception of the force we call gravity, and which we will study in the light of modern knowledge in these articles.

Progress and Aims of the American Institute of Steel Construction

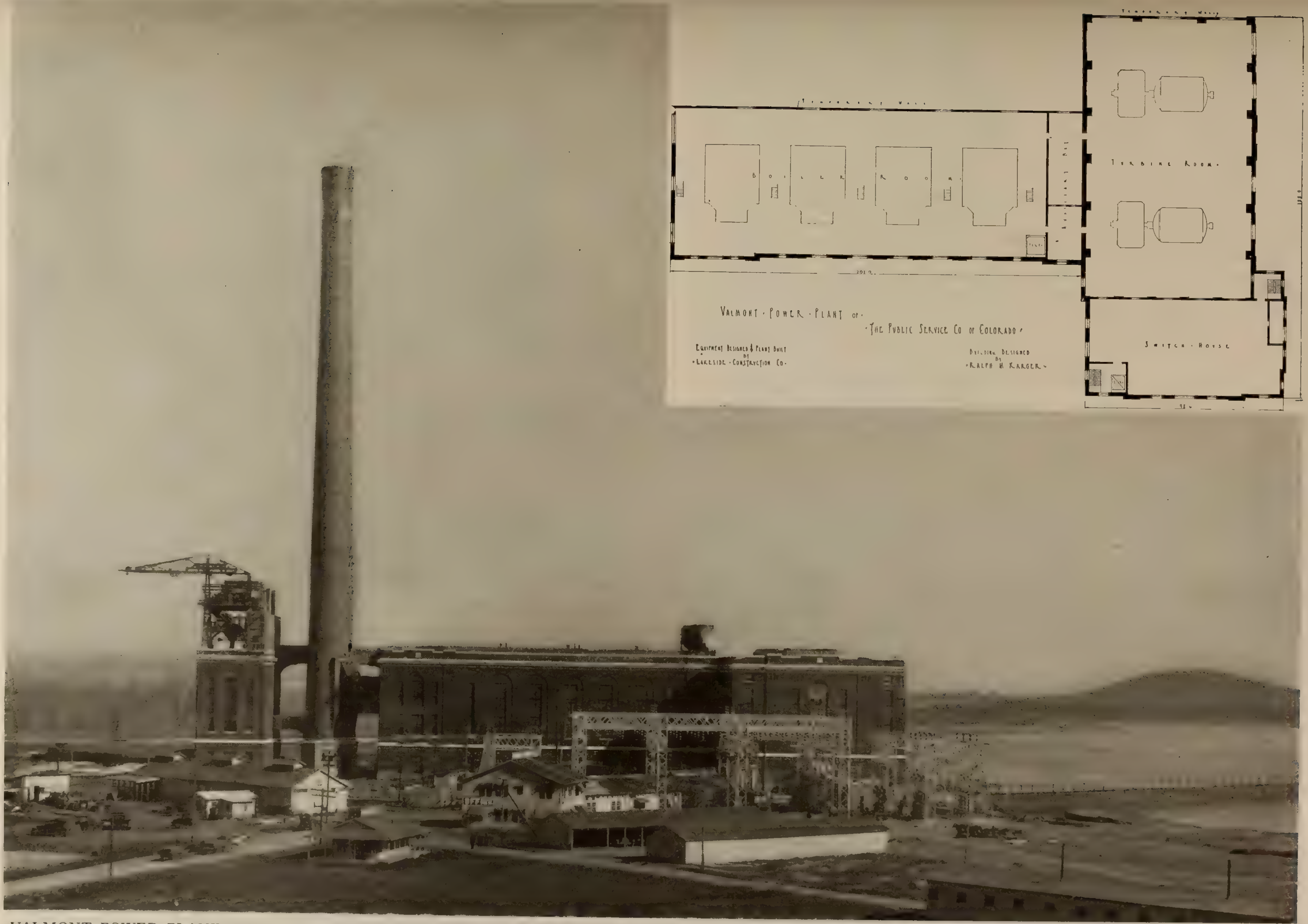
AT a recent meeting of the American Institute of Steel Construction, held in Boston, members of the building professions and others interested in the use of structural steel heard what the Institute has already accomplished, and what it hopes to accomplish as a result of its campaign to benefit both the fabricator and the public by securing the general adoption of its new standard specification of unit stress, and by the further introduction of construction economies, together with better business methods among the fabricators of structural steel.

The subject of the address of Mr. L. H. Miller, who is the chief engineer of the Institute, was the new standard specification of 18,000 pounds per square inch, which was developed by a committee of architects and engineers headed by Professor George F. Swain of Harvard University. "Since about 1885," said Mr. Miller, "when structural steel was first used as a building material, a working stress of 16,000 pounds has been prevalent in building construction. This figure has no authoritative basis. It was evolved from the rule-of-thumb methods, proportioned by safety factors based on ultimate strength; following the custom developed in the application of rational design to masonry and timber structures.

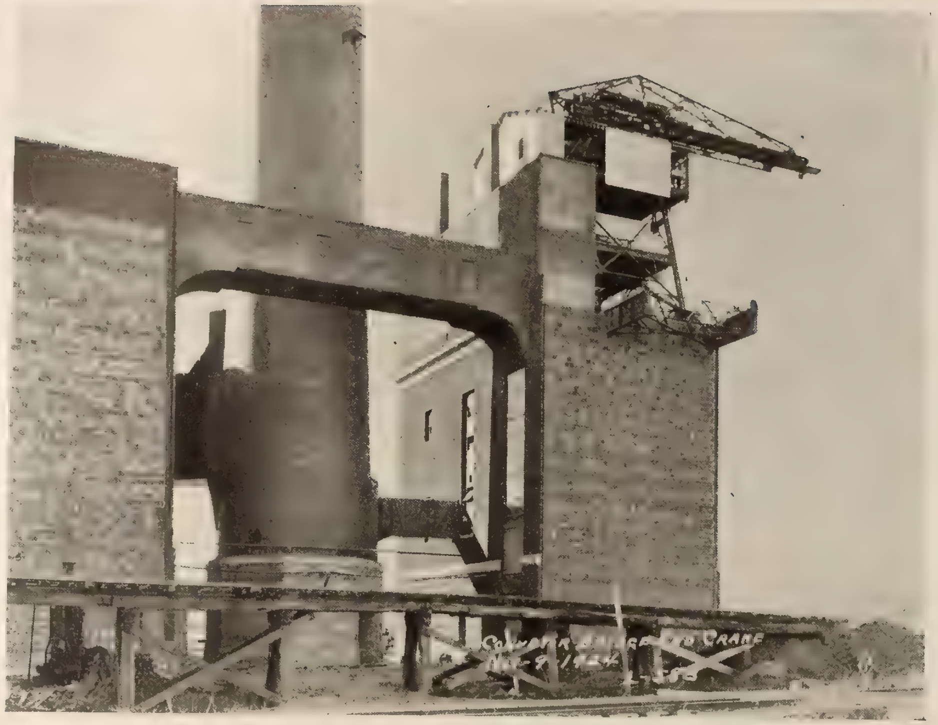
"Open-hearth steel, with its more uniform characteristics, has almost entirely supplanted the Bessemer steel used in structural shapes in the late '80's and early '90's. The quality of steel has steadily improved, but in many sections of the country the unit stress of 16,000 pounds is still incorporated in the building codes. However, due to the educational work of the Institute, some forty large cities throughout the United States have now revised their codes to permit the use of the 18,000-pound unit stress.

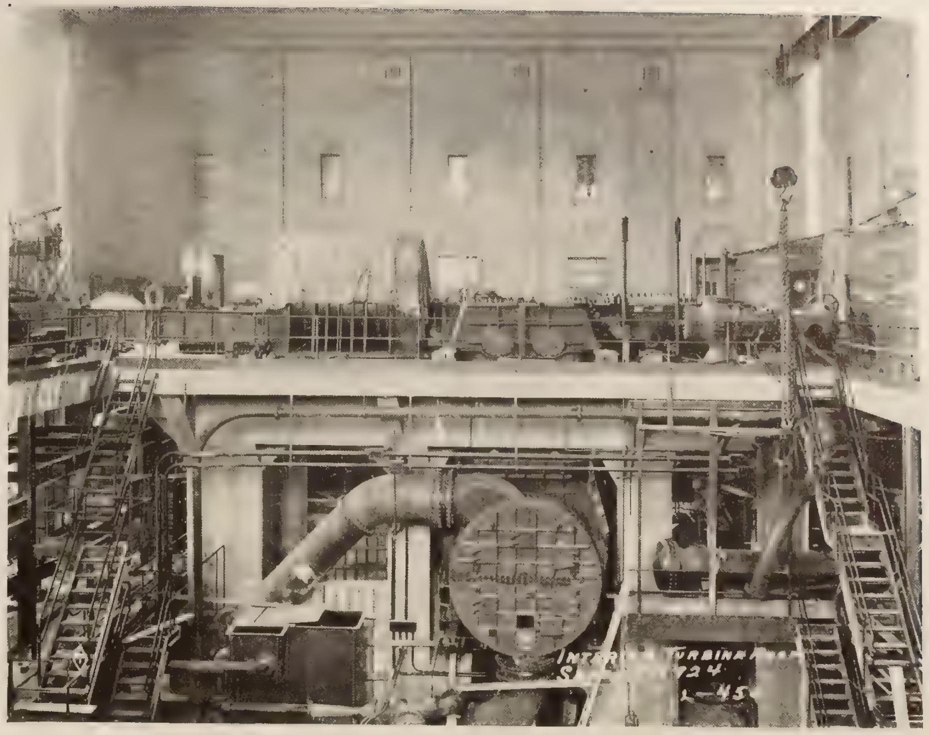
"The successful operation of the codes using the new unit stress has resulted in great economies for the individuals, builders, and taxpayers of the cities where the new specification has been adopted. The saving made possible by the use of the 18,000-pound unit stress is estimated at from 10 to 12 per cent of the cost of steel entering into the structure. The general adoption of the new unit stress will mean an annual saving of not less than $30,000,000 to the country at large."

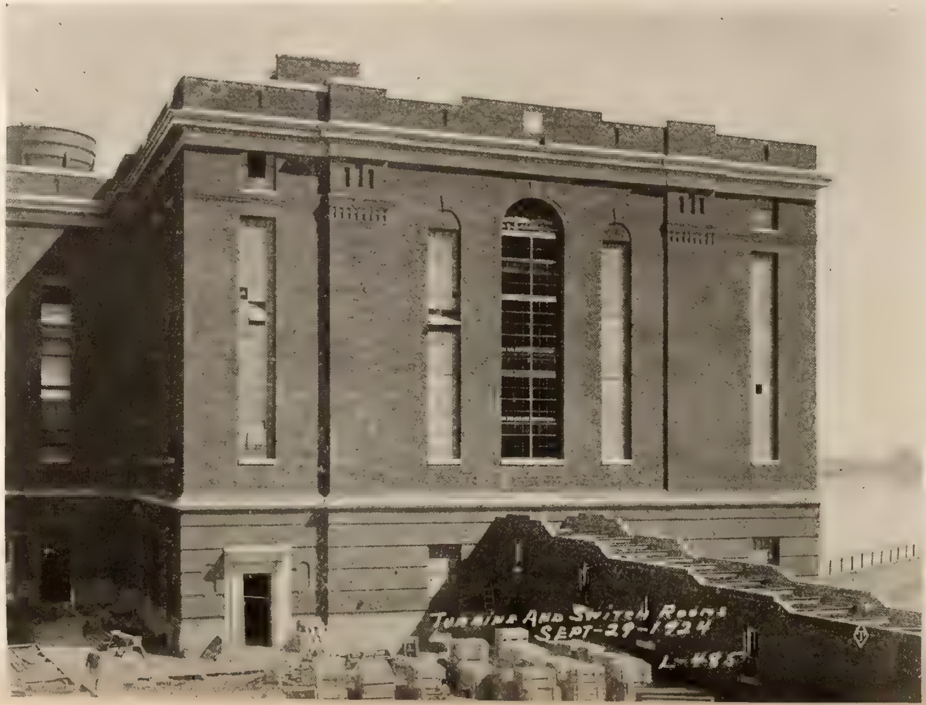
With its new standard unit stress steadily gaining ground, and with the code of Standard Practice proving its value, the Institute is ready to enter upon its comprehensive programme for the years immediately ahead. A Standard Manual to facilitate the work of the designer and the draftsman in the execution of the contract after it has been secured is now in course of preparation. A Bureau of Technical Research is being formed. The campaign to bring out the advantages of structural steel and to secure the wider adoption of the 18,000-pound unit stress is being vigorously pressed. Finally, work with students at universities and technical schools is being planned for in the near future.


Temporary Wall
Boiler Room
Auxiliary Bay
Turbine Room
Switch House
Temporary Wall
301.2
138.0
93
Valmont · Power · Plant of ·
· The Public Service Co of Colorado ·
Equipment Designed & Plant Built by
· Lakeside · Construction Co ·
Building Designed by
· Ralph M Karger ·

VALMONT POWER PLANT, BOULDER, COLO, PUBLIC SERVICE CO, OF COLORADO, Designed by Ralph M. Karger.







Valmont Power Station

By Ralph M. Karger

THE Valmont Power Station, situated on the outskirts of Boulder, Colo., a mile above sea level, has a rugged background of snow-capped mountains. Æsthetically, the site is well suited to a building of large scale.

The plant is of the steam-generating type, receiving its condensor water supply from an artificial lake just adjoining the turbine-room. Concrete intake tunnels, surmounted by an esplanade, convey the water into the building. The present installation is comprised of two 25,000 K. W. turbo-generators, the second machine being installed at the present time. This building is the first portion of the ultimate 200,000 K.W. station, which, when completed, will be approximately five times its present size.

The walls are of brick and self-supporting. Exterior face brick is rough in texture and varies in color from light red to dark blue. Laid in a dark-blue mortar with raked joints, the wall presents an interesting study of light and shade. The exterior trim is of terra-cotta, with a mottled gray-white finish. An an indication of the scale of the building, it may be noted that the belt course is two feet high.

The switch house is five stories high and contains not only the necessary electrical equipment, but also a drafting-room, hospital, laboratory, and offices.

Due to the necessity for future expansion, the building is closed in at the temporary end with a hollow terra-cotta tile wall. When additions to building are necessary, this wall will be removed, one or more generating units will be added, and the building will creep forward to its ultimate size.

VALMONT POWER STATION, BOULDER—COLO.— Designed by Ralph M. Karger

The Romance of Building

By Richard P. Wallis

FOURTH ARTICLE

AMONG the humbler of the metals entering into the construction of the library we find the element lead. The peculiar properties of this material, its high specific gravity, extreme ductility, and low melting-point, render it of great service in a number of ways. Lead flashings, pipes, caulkng, solder, fusible links, cames for leaded glass are all examples of the use of this material in metallic form. We find a arge percentage of lead in plate glass, where, like the salesman's mythical raincoat in the "swindle sheet," it's there but you can't see it!

An underground scene in a copper-mine, showing loading of ore into small cars.

Important as are these uses, their value to mankind is perhaps overshadowed by certain of the chemical derivatives of lead that have been developed and are in constant use to-day.

The final decorative effects desired by the architect are usually made possible only through the use of paint. This paint, in addition to the pleasing effect in color and design produced, exercises a potent protective function that preserves and protects the underbody, irrespective of its nature. We are all familiar with the slogan of the paint manufacturers: "Save the surface and you save all." Its utilitarian benefits may be measured in dollars and cents, but the intangible service rendered mankind through the creation of beautiful surroundings n which to work and play is incalculable. The finite expression of the arts and sciences of ife is made possible largely through the use of paint.

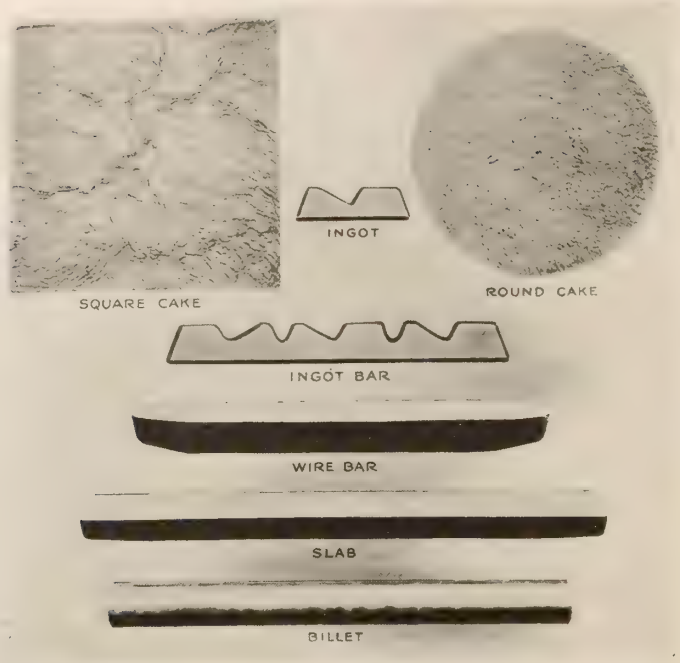
The perfect paint as we know it is a mixture of white lead and linseed oil, to which are added various pigments in order to secure the color effect desired by the architect. The white lead used in this connection is technically known as a basic lead carbonate and averages about 69 per cent carbonate of lead and 31 per cent hydrate of lead. Lead has been utilized for this purpose since the dawn of the Christian era, and much the same process of manufacture is in use to-day as in historic times. As in other manufactured building products, the principal advance has been in obtaining higher purity, greater fineness, and definite control of manufacture. To-day white lead is manufactured by what is known as the "Old Dutch Process"—used by the Dutch during the Middle Ages and inherited by them from the Venetian and Genoese trades of that time. The progress of this material from pit to paint-pot is of sufficient interest to warrant a brief outline of the manufacturing process involved, and is typical of the uses to which chemistry and physics are put in making available for the edification of mankind the raw product of our mines and forests.

Metallic lead is found usually in combination with sulphur as lead sulphate, or galena, so familiar to our amateur radio enthusiasts. These deposits occur over a wide range of territory, but, according to the United States census, the State of Oklahoma leads in the production of this material.

This raw ore is found from five to six hundred feet underground, and great shafts or pits must be blasted out before the lead rock can be obtained. The first process in the utilization of this raw product consists in crushing the ore as mined to the consistency of coarse sand. Once this state is reached it is necessary to extract the earth and other associated impurities that invariably are found in combination with lead. Gravity effects the separation of lead ore and the "gangue," or lighter waste. The "concentrates," as they are now called, are then carefully roasted and smelted to drive off the sulphur, leaving crude lead.

The next step is the separation of the remaining impurities, silver (paradoxically enough), copper, and certain other metals heretofore in combination with the lead. Fragments

Utah Copper Company's mine.



Refining copper in the forms in which it is sold by the producer to the fabricator.

of zinc cast into the molten lead quickly melt and, owing to their affinity for silver, a new and lighter compound is formed, that, due to the difference in weight, floats on top and is thus easily drawn off, after which the silver is reclaimed and becomes a valuable by-product.

Once refined, the metallic lead is cast into pigs about 4 inches by 5 inches by 22 inches and weighing about 90 pounds each. At this point the special process destined to produce white lead is commenced. These pigs are recast in the form of "buckles," so called from a fancied resemblance to the ornaments worn on the shoes of our ancestors of Colonial times. Ten to fourteen of these buckles are placed in a corroding-pot, similar in shape to a flower-pot but with a free cup-shaped space of about two inches at the bottom. Into this rounded bottom is poured about half a pint of weak acetic acid, practically vinegar. The corroding-pots are placed in the stack-house in layers alternating with tiers of spent tan-bark about twenty inches thick—each layer separated from its neighbor by a floor of loose boards.

A typical stack measures about 22 feet long, 20 feet wide, and 30 feet high. It is at this point that the chemical action destined to produce white lead commences. The decomposition of the tan-bark produces sufficient heat—185° F.—to vaporize the acetic acid. These fumes seep upward through the perforations in the buckles, slowly converting the dull-gray metallic lead into a white-lead acetate. Simultaneously the carbon dioxide from the fermenting tan-bark reduces the lead acetate to a basic lead carbonate. Approximately from ninety to one hundred days are consumed in the process, and about 80 per cent of the original lead eventually becomes lead carbonate.

When the stacks are "stripped" this lead carbonate is found, still in the form of the original buckles, but snow white in color and very brittle.

From then on the process consists in reducing this lead carbonate to its final, almost impalpable form by passing it through a series of steel rollers, or "breaks," as they are called. Selective screens separate the coarse particles from the fine until the final break produces a product about the consistency of fine white cornmeal. The rejected portions are reground until practically the entire buckle is reduced to the same fine consistency.

In this form the carbonate is not yet nearly fine enough for use in paint and must accordingly be subjected to additional grinding to reduce it to the specified fineness. Water grinding, as it is called, is the next step in this process of attrition. Huge millstones, in pairs, placed horizontally, grind between them a mixture of carbonate and water until certain of the carbonate is reduced sufficiently to enable it to float on the surface of the water. Here again the fine and comparatively coarse particles are separated by various intricate mechanical devices, the fine particles being passed on, the others returned for additional grinding. The final test for fineness is the ability to pass through a shaker sieve of silk bolting-cloth with meshes so fine that there are 27,000 or more to the square inch. The material not rejected by this last test is conveyed to steam-jacketed pans, there to be dried.

The final step in the preparation of commercial white lead is the addition of a small amount of pure linseed oil. The usual proportion is about 8 per cent oil to 92 per cent lead. This mixing is accomplished in what is called a "chase," in which a millstone weighing a ton and a half thoroughly incorporates these two ingredients.

The white lead is then ready to be packed in steel casks and placed on the market for the painter and decorator.

Open-pit iron-mine.

Typical blast-furnace in operation.

It is interesting to note the diminution in bulk as the manufacturing process proceeds. Roughly, a pound of commercial white lead represents an initial equivalent of thirteen pounds of lead ore.

Were it but possible to devote sufficient space to a discussion of the origin, manufacturing processes, and uses of all of the varied materials employed by the contractor in carrying out the injunctions of the designer a story would result rivalling in interest the most intriguing romance. Kipling, in his yarn "The Ship That Found Herself," has sensed the intense individuality of these inanimate objects and has endowed each with a vivid personality.

The same marshalling together of a host of hitherto uncorrelated elements with the ultimate merging of their individual characteristics into an entirely new entity is no less true of buildings than of ships.

Building is essentially a creative industry and as such is leavened with the individual personalities of those responsible for its success. It represents ineffable co-ordination of thought and effort, and stands as a pre-eminent and lasting monument to human achievement.

Just as the early voyages of exploration and wars of conquest were inspired by the dominant desire for trade control, so is our present-day search for fresh deposits of raw materials. The search to-day for fresh fields for exploitation is conducted by our entrepreneurs in a careful and painstaking manner, made possible only by the scientific advance of the age in which we live, undreamed of by our predecessors. Our tariff feuds and trade wars, while less bloody in their conduct than the almost constant military warfare of a century ago, are waged in a manner no less fierce. Both find their inspiration in the natural struggle of nations to expand and inject new life-blood of trade and commerce into their veins.

Where the Spanish conquistador of the Middle Ages sought gold in the fabled El Dorados of the New World his successor seeks the more prosaic but intrinsically more valuable deposits of coal, oil, and iron, without which a nation is doomed to colorless mediocrity in the concourse of nations.

The geography of building is the geography of trade, and therein lies much of the romance of building.

Front view of open-hearth furnace, charging side.

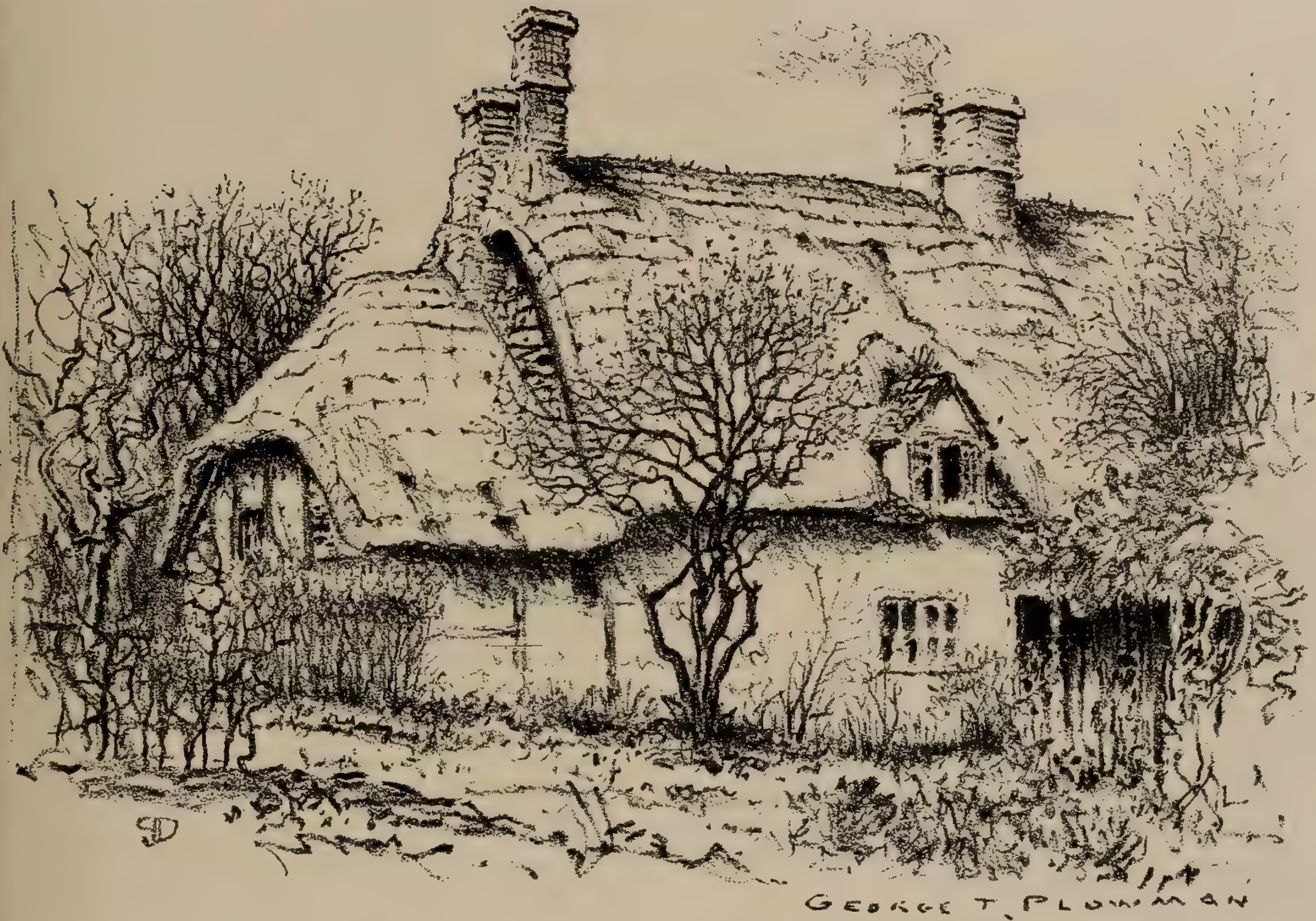
KEY TO CHART SHOWING GEOGRAPHICAL DISTRIBUTION OF RAW MATERIALS. CLEVELAND PUBLIC LIBRARY

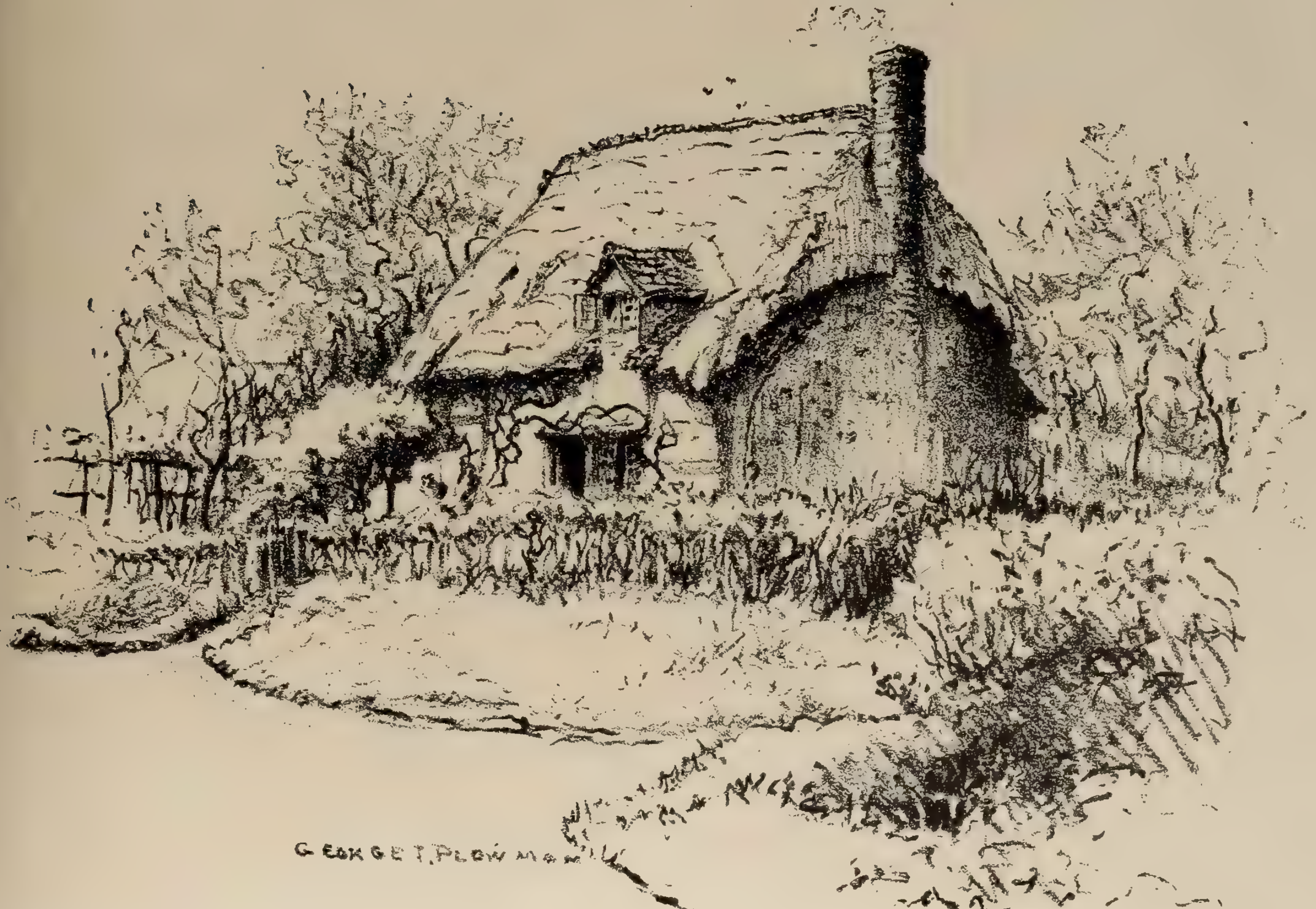
SERIAL NO.	MATERIAL	WHERE USED	SOURCE
1	Portland cement	Concrete, mortar	Ohio
1A		Sidewalk lights	Pennsylvania
2	White cement	Face brick mortar	Pennsylvania
3	Keene's cement	Damp-proof plaster	Kansas
4	Hydrated lime	Plaster, brick mortar	Ohio
5	Gypsum	Floor voids, plate glass, cement, plaster	Ohio
6	Crushed slag	Concrete	Local
7	Concrete sand	Concrete	Ontario
8	Brick sand	Brick mortar	Local
9	White sand	Stone mortar	Ohio
10	Silica sand	Sidewalk, plate glass	Illinois
11	Torpedo sand	Sidewalk lights	Wisconsin
12	Rough sand	Plate glass	Michigan
13	Sand	Polished wire glass	Pennsylvania
14	Plaster sand	Plaster	Local
15	Common brick	Back-up and partition	Local
16	Face brick	Court facing	Pennsylvania
17	Fire brick	Boiler arches	Pennsylvania
18	Paving brick	Floor	Ohio
19	Hollow tile	Back-up and partition	Local
20	Guastavino tile	Brett Hall roof	New Jersey
21	Architectural Terra Cotta	Ornamentation	New Jersey
22	Kaolin	Porcelain	New Jersey
23	Ball clay	Porcelain, flint paving tile	Kentucky
24	Feldspar	Flint paving tile	Maine
25	Shale	Quarry tile	Tennessee
26	Slate	Thresholds	Pennsylvania
26A		Electric panels	Vermont
27	Bauxite	Alumdum terrazzo, aluminum	Arkansas
28	Asbestos	H. M. doors, gaskets	Ontario
29	Mica	Electric lights, electric equipment	India
30	Limestone	Concrete	Ohio
30A		Structural steel	Michigan
30B		Plate glass	Pennsylvania
31	Flint	Flint paving tile	Pennsylvania
32	Soda ash	Plate glass	Michigan
33	Salt	Plate glass	Michigan
34	Sulphur	Rubber	Louisiana
35	Chalk	Putty	Great Britain
36	Tokeen marble	Panel boards	Alaska
37	Georgia marble	Exterior masonry	Georgia
38	Botticino marble	Interior, Scagolia, alumdum terrazzo	Italy
39	Travertine	Interior marble	Italy
40	York fossil	Interior marble	New York
41	Nebo golden Travis	Interior marble	Utah
42	Pink Tennessee	Interior marble	Tennessee
43	Clear-face Tennessee	Interior marble	Tennessee
44	Tavernelle Fleuri	Interior marble	Italy
45	Rose Tavernelle	Interior marble	Italy
46	Levanto	Interior marble	Italy
47	Senora	Interior marble	France
48	South American Black and Gold	Interior marble	Uruguay
49	Blue Belgian	Interior marble	Belgium
50	Deep yellow sienna	Interior marble	Italy
51	St. Genevieve golden vein	Interior marble	Missouri
52	Cream A Alabama	Interior marble	Alabama
53	Granite	Steps	Maine
53A		Paving block	Wisconsin
53B		Sidewalk lights	So. Dakota
54	Trap rock	Asphalt tile	New Jersey
55	Magnesia	Pipe covering	Pennsylvania
56	Magnosite	Composition floor	Greece
57	Magnisium chloride	Composition floor	Germany
58	Iron	Structural steel	Cuba
58A		Pipes, ornamental iron, pigments, etc.	Minnesota
59	Lead	Paint pigment, litharge, pipes, flashing, caulking	Oklahoma
60	Manganese	Face brick	Virginia
61	Zinc	Mechanical trades	Oklahoma
62	Copper	Roofing, wire, bronze, babbit metal	Arizona
63	Tin	Bronze, solder, babbit metal	Straits Settlement
64	Mercury	Paint pigment, thermometers	California
65	Nickel	Plating	Ontario
66	Silver	Mirrors	Colorado
67	Gold	Gilding	Colorado
68	Natural graphite	Pipe covering	Ceylon
69	Antimony	Babbit metal	Mexico
70	Chromium	Paint pigment	Russia
71	Cobalt	Paint pigment	Ontario
72	Coal	Plate glass, cinders, paint pigment, tar	Pennsylvania
73	Natural gas	Plate glass, paint pigment	W. Virginia
74	Mineral oil	Lubrication, elevator bumper	Oklahoma
75	Asphalt	Mastic, sidewalk lights	Trinidad
75A		Water-proofing	Mexico
76	Yellow pine	Forms, elevators	Louisiana
77	White pine	Blocking, grounds	Minnesota
78	Oregon pine	Flagpole	Oregon
79	Chestnut	Ribs for copper roof	W. Virginia
80	Oak	Bumpers	Arkansas
81	Maple	Elevator floors	Michigan
82	Cypress	Sinks	Louisiana
83	Bass wood	Toilet fixtures	Wisconsin
84	Cork	Bulletin boards, linoleum	Spain
85	Cotton	Water-proofing, insulation	Texas
86	Flax	Linseed oil, linoleum	N. Dakota
87	China wood oil	Sidewalk lights	China
88	Turpentine	Paint	Florida
89	Copals	Varnish	Zanzibar
90	Castor oil	Heat and ventilating equipment	Texas
91	Hemp	Okum	Philippines
92	Paper	Charts	Ontario
93	Jute	Burlap	India
94	Rubber	Insulation	Brazil
95	Lac	Shellac	India
96	Leather	Leather-covered doors	Texas
97	Glue	Adhesives	Texas
98	Wool	Felt pipe covering	Montana
99	Hair	Plaster	Texas

New York's Pressing Traffic Problems

LOOKING forty years into the future to the year 1965, traffic experts of the Regional Plan of New York and Its Environs predict that the volume of traffic in that year on the twenty-three main arterial highways leading into New York City from the outlying areas in New York, New Jersey, and Connecticut will be from three to three and one-half times the present maximum capacity of those thoroughfares. The estimate of this great increase in vehicular traffic is contained in a 125-page monograph recently made public by the Regional Plan of New York and Its Environs.

Traffic in New York City, states the report, and in particular Manhattan Island, has already reached such a point that the north and south avenues crossing 48th Street will be carrying the limit of their traffic hourly capacity by the year 1930, even though present official proposals for increasing available roadway space are carried out.





COUNTRY COTTAGES IN ENGLAND.

From the lithographs by George T. Plowman.

An Architect's Simple Engineering Problems

By DeWitt Clinton Pond, M.A.

TWELFTH ARTICLE

THE use of concrete in the last few years has become more and more universal, until almost all foundation walls are built out of this material, no matter how large or small the building may be, and of course large reinforced concrete buildings are built for factory, warehouse, and certain commercial purposes everywhere. It is unfortunate that more artistic uses are not made of this material. It is the author's opinion that as wood becomes more expensive concrete will be used for residential purposes and architects will see that houses of Spanish or Italian design can be built both beautifully and permanently of concrete. This, perhaps, is a rather long look into the future.

As a material for supporting walls, piers, or columns concrete, plain or reinforced, is a particularly suitable material. Whereas the New York Building Code allows a compressive stress on brick masonry in Portland cement mortar of 250 pounds per square inch and on rubble stone in cement mortar of 140 pounds per square inch, concrete, mixed in the proportions of one part cement, two parts sand, and four parts broken stone, is allowed 500 pounds per square inch. When reinforced the allowable stress increases much beyond this, as will be shown later.

Concrete columns may be reinforced in three ways. These are shown diagrammatically in Fig. 23. The most common method of reinforcing concrete columns is to place in them vertical rods which are held in position by hoops of ties placed not more than one foot on centres. This is the type of reinforcement used where loads are not particularly heavy or where the area of the column may be comparatively large without interfering with the architect's plan. Exterior columns in large buildings are usually reinforced in this manner. The New York Code can be regarded as a very good text-book on concrete design, and most of the following calculations will be based upon the requirements given therein. The type of column referred to above is referred to in the Code as a column "with longitudinal reinforcement only." This may have "not less than one-half nor more than 4 per cent of vertical reinforcement secured against displacement by $\frac{1}{4}$-inch steel ties placed not farther apart than 15 diameters of the vertical rods nor more than 12 inches." The allowable load on such a column may be determined by allowing "500 pounds per square inch on the concrete, plus 7,500 pounds on the vertical steel." By referring to this there should be but little difficulty in designing a reinforced concrete column.

Assuming a 14-inch square column is to be used, then the area of the column will be 196 square inches. It is possible to use as little as $\frac{1}{2}$ of 1 per cent of steel reinforcement and therefore, as steel is more expensive than concrete, only this amount will be used, which is .98 of a square inch of steel.

If the concrete alone were used and the usual compression value of 500 pounds were allowed, the bearing value of the column would be 98,000 pounds. However, there is an additional load which may be placed upon the column because of the steel reinforcement. The allowable load on the steel is 7,500 pounds per square inch, as stated above, and if 500 pounds, which is allowed to the concrete, is deducted, then the net additional load carried by the steel may be considered as 7,000 pounds per square inch.

$$.98 \times 7{,}000 = 6{,}860 \text{ pounds}$$
$$98{,}000 + 6{,}860 = 104{,}860 \text{ pounds}$$

The total load that the column will carry is slightly over 52 tons. For the type of work which an architect may have to design the loads carried by such columns are often much more than the actual load that will rest upon them. Just the knowledge that a 14-inch column will carry a load similar to the one determined above will enable him to judge the bearing capacity of the ordinary columns he may have to place in a small building.

There are several items that must be kept in mind with regard to such columns. No columns can be made less than 1 foot square nor can the diameter—or least dimensions of a rectangular column be less than one-fifteenth of the height. Not often do conditions arise where an architect would have reason to violate either one of these rules.

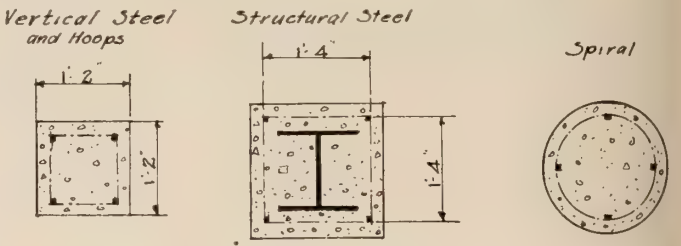


FIGURE 23

Another consideration is that more steel may be used and a richer mixture of concrete in case it is desirable to keep the size of the column within certain limits established by architectural conditions. With regard to the richer mixture the allowable stress in the concrete may be increased to 600 pounds if a "one, one-and-a-half, three" mixture is used or 20 per cent more than the allowable stress given above. In this case, however, the allowable stress in the steel must be reduced to 7,200 pounds per square inch.

In case the richer mixture were used in the problem given above, the load would have been determined in the following manner:

196 sq. in. at 600 lbs. per sq. in. = 117,600 lbs.
.98 " " " 6,600 " " " " = 6,468 "
Total........................ 124,068 "

The 6,600 pounds allowed to the steel was found by deducting the unit stress in the concrete—600 pounds—from the unit stress in the steel—7,200 pounds.

In case 2 per cent of steel were to be used, then the area of the steel would be 3.92 square inches, and the steel would be considered as carrying 25,872 pounds, and the total load that the column would be allowed to carry would be 143,472 pounds, or nearly 72 tons. By increasing the area of the steel still more an even heavier load could be carried but the percentage must not be increased to more than 4 per cent. In order to make up the vertical steel that would be required in the column having ½ of 1 per cent of steel, four ½-inch square bars would be required and the hoops would have to be placed 7½ inches on centres.

Few architects who do their own engineering work have occasion to design supports to carry much more than the loads given above, but there may be problems encountered which would require a different kind of reinforced concrete column. One of the chief objections to reinforced concrete buildings of greater height than ten stories is that the columns become very large throughout the lower floors. This may be overcome if structural steel shapes are used to reinforce the supports. As a matter of fact, there might be conditions in which columns of this type might be smaller than steel columns which are properly fireproofed. Recent tests have proven that three inches of fireproofing around structural steel makes an almost perfect protection, while the usual two inches sometimes fails before the fire that surrounds it is extinguished. If structural steel columns are designed on the basis of calculations given in the last article, so that the unit stress is about 12,000 pounds, and if 3 inches of fireproofing protects the steel, the actual outside dimensions of a structural steel column designed and protected in this manner will be only a little smaller than a concrete support reinforced by means of a Bethlehem H section.

A support of this type is referred to in the Code as a structural steel and concrete column. The steel must be "thoroughly encased in concrete not less than 4 inches thick and reinforced with not less than 1 per cent of steel." On such a column the allowable load may be "16,000 pounds per square inch on the structural steel." It can be seen from this that the concrete that encases the steel is supposed to provide such stiffness that the structural steel may be given its total compressive value, and no allowance is made for bending. In order to do this the concrete is reinforced by rods and the required percentage is found by dividing the *volume* of the reinforcing steel by the *volume* of the concrete enclosed by it. This may need a little explanation.

Suppose a condition is assumed in which a 12-inch, Bethlehem H section, weighing 79 pounds per foot, is encased in 4 inches of concrete. The area of such a section is 22.94 square inches, and the supporting value of such a column is $22.94 \times 16{,}000 = 367{,}040$ pounds, or 183.5 tons.

The reinforcing steel must not be placed nearer than 1 inch to the structural steel or the outer surface of the concrete. Usually it is placed 2 inches back of the face of the concrete, so the rectangle of concrete enclosed within the reinforcement will measure 16 inches by 16 inches (Fig. 23), and the area of this square is 256 square inches. From this the area of the column must be deducted:

$$256 - 22.94 = 233.06 \text{ square inches}$$

One per cent of this area is 2.33 square inches, which must be made up of ties and vertical reinforcement. With regard to this the Code states "not more than one-half of the reinforcing steel shall be placed vertically." In any section one-half of the required *area* will be $2.33 \div 2 = 1.16$ square inches. In a foot of heights the *volume* of the reinforcement shall be $1.16 \times 12 = 13.92$ cubic inches of steel. If ⅜-inch square bars are used for hoops, the area of each bar will be .1406 square inches. The length of steel required to make a hoop will be $4 \times 16 = 64$ inches, and the volume of steel in each hoop becomes $64 \times .1406 = 9.0$ cubic inches. Now there are 10.44 cubic inches of steel needed if the volume of the hoops is to equal the volume of the vertical reinforcement. So in every foot of height there must be $10.44 \div 9.0 = 1.16$ hoops, which should be spaced $12 \div 1.16 = 10.03$ inches on centres. The chances are that the concrete will be reinforced more than necessary, as ½-inch square bars will be used vertically and hoops made of ⅜-inch bars will be spaced 10 inches on centres.

To determine the area and volume of the reinforcement for such a condition requires no small amount of figuring, but to find the actual supporting value of a column of this type is a very simple matter.

The method of using the full compression strength of steel when encased in 4 inches of concrete is very useful when it is necessary to strengthen columns in a building on which an additional floor is to be placed. It is a comparatively simple matter to take down the existing fireproofing around a column and encase it with 4 inches of reinforced concrete. The additional strength gained in this manner is often enough to make the addition of another story possible.

A third type of reinforced concrete column is one in which spirals of steel are used to restrain the concrete within them and in this manner to give additional strength to the concrete. Supports of this type are very common in large concrete buildings, as the area of such columns is very much smaller than those in which vertical reinforcement is used and the cost is comparatively small as compared with those reinforced by structural steel. However, the buildings in which columns of this type are found are of a kind that should be designed by engineers throughout, and an architect who only develops simple parts of his structure should not attempt to design supports of this character.

THE END.

Power and Mechanical Engineering Exposition

THE Fourth National Exposition of Power and Mechanical Engineering will be held in the Grand Central Palace, New York, from November 30 through December 5, 1925.

The Power Show, as this exhibition is styled, is an important clearing-house of information for the executives and engineers of all industries. In this it is different from the exhibitions devoted to the equipment of a single industry, as power is a fundamental factor in every industry, and a showing of the machines and apparatus required for its economical generation and use gives an opportunity to every industrial executive to discover some means of cutting his promotion costs.

At the coming show a series of exhibits of heating and ventilating machinery will form an important addition to the lines usually represented. This broadening of the scope of the show is an acknowledgment of the increased importance that manufacturers now attach to the need for modern methods of heating and ventilation in the factory. The heating and ventilating problem is closely allied to the power problem of an industry, and the advances in one art are generally applicable to the other. This innovation at the coming show will, therefore, increase its value to the visitors, who will find much of real worth in the exhibits of all phases of the heating and ventilating art.

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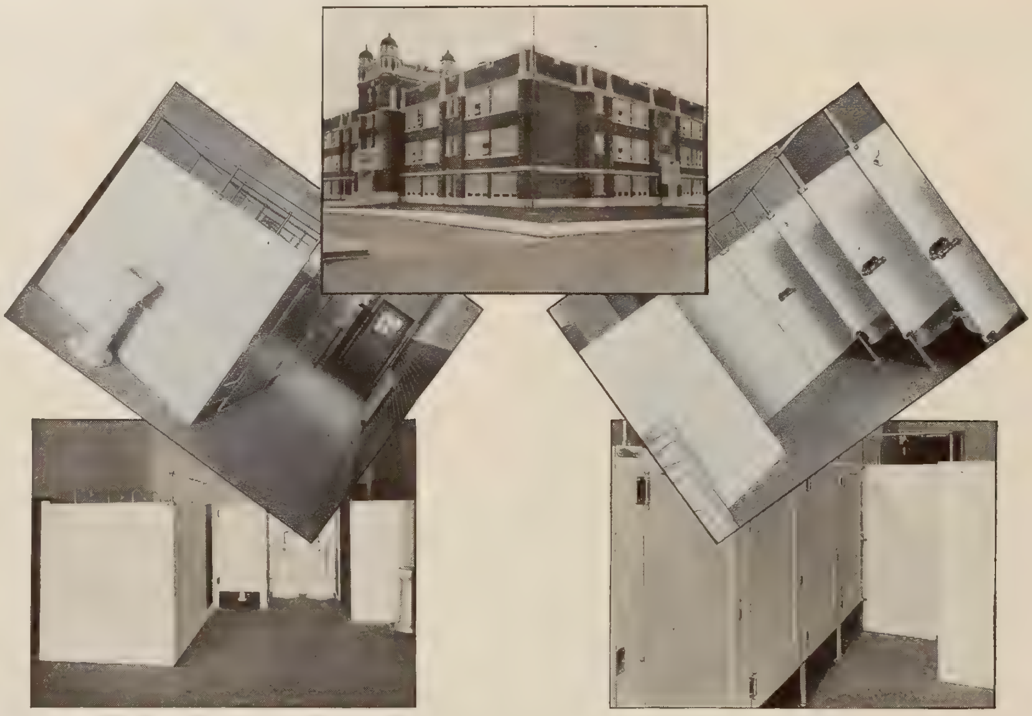

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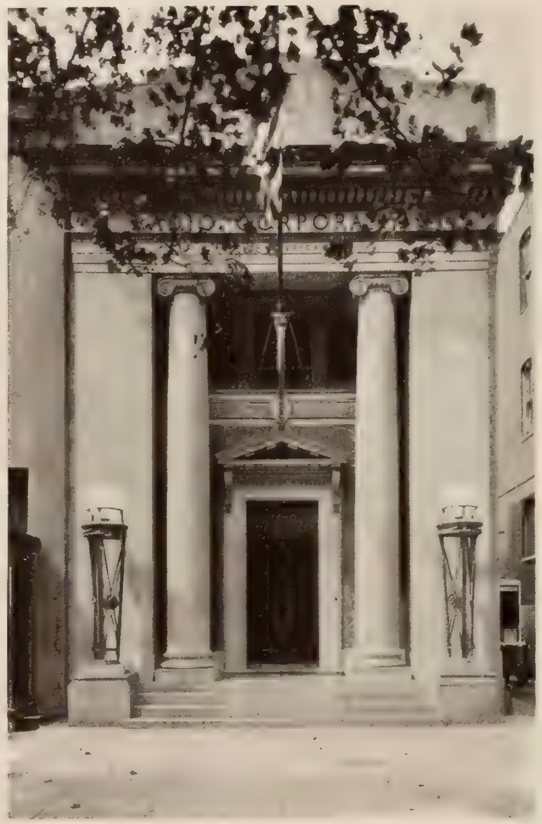

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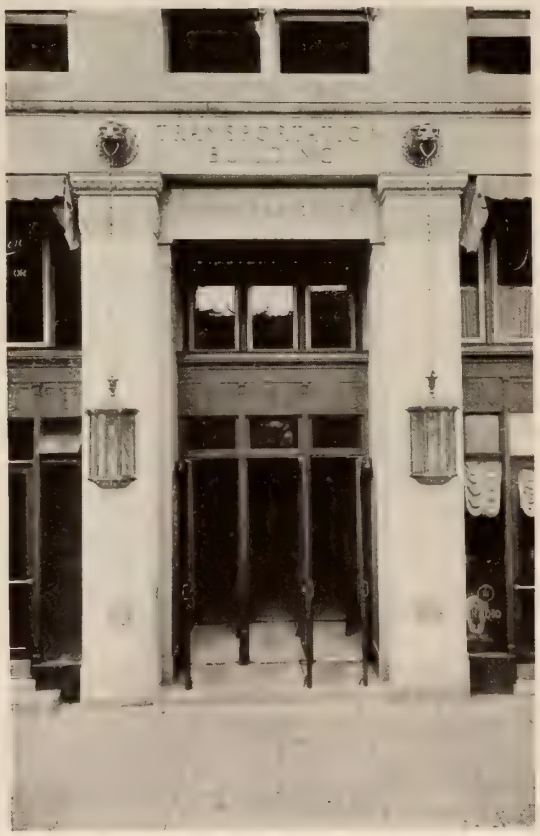

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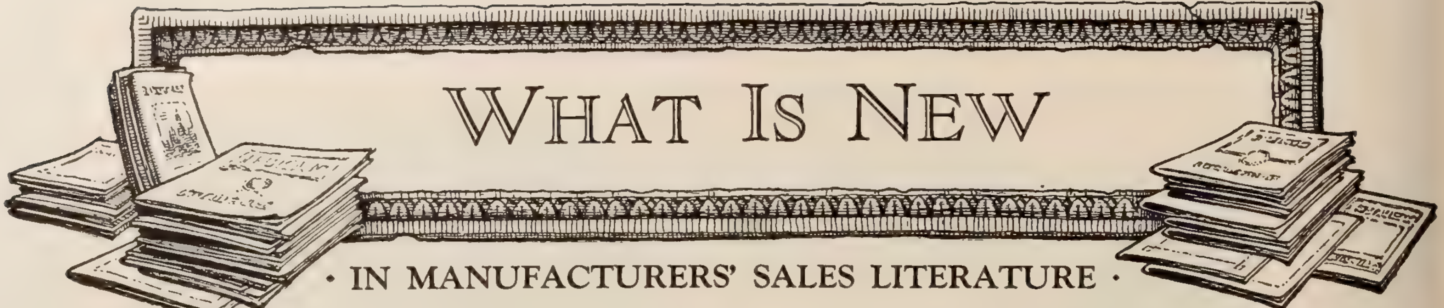

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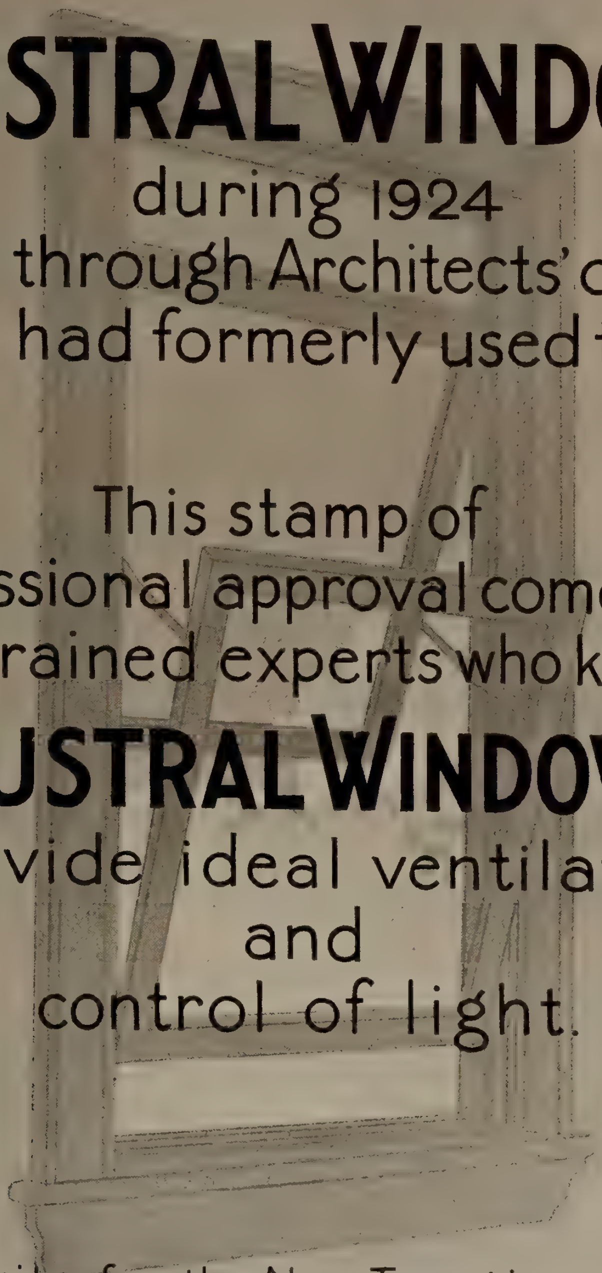

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J. S. Patrick began to recommend and install H. B. Smith Heating Equipment.

R. L. Patrick joined his father as a heating contractor. He, too, recommended and installed H. B. Smith Heating Equipment.

J. H. Patrick, of the third generation, joined his father and grandfather in the G. S. Blodgett Company.

All three are still using and recommending H. B. Smith Heating Equipment.

They have built up a successful business in Burlington, Vt., of which they are justly proud. So are we. Because, for a business to be successful through three generations, means that the products and policies must ***always*** have been the best. They have ***always*** used and recommended H. B. Smith Heating Equipment.

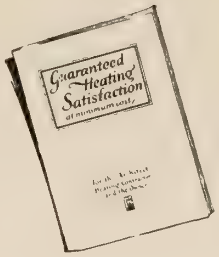
You are invited to draw your own conclusions.

THE H. B. SMITH COMPANY
Dept. F-11, Westfield, Mass.

Sales Offices and Warehouses at:

WESTFIELD BOSTON NEW YORK
PHILADELPHIA CLEVELAND

THE H·B·SMITH
BOILERS & RADIATORS
Used in fine homes and buildings since 1860



The Truth About Boiler Ratings

To help you acquaint your clients with the truth about boiler ratings, we have recently issued a 16-page booklet called "Guaranteed Heating Satisfaction at Minimum Cost." It thoroughly covers the subject of boiler ratings and explains, in an easily understandable way, why the inability to keep warm in extreme cold weather is proof of daily fuel waste. It will help you to convince your clients why they should be careful to get a fairly rated boiler of the proper size. Your copy is free. For your convenience in ordering it, please use the coupon below.

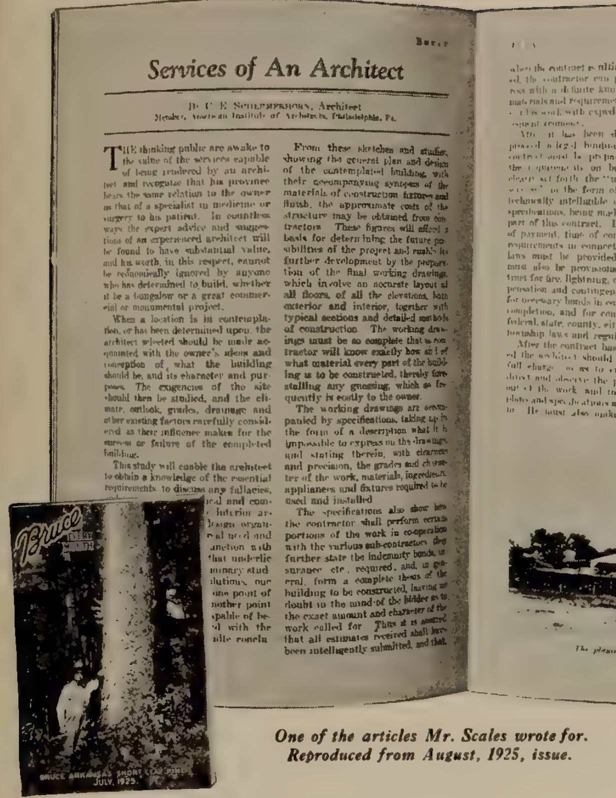
THE H. B. SMITH COMPANY
Dept. F-11, Westfield, Mass.

Gentlemen: Send a copy of your new booklet on Boiler Ratings to:

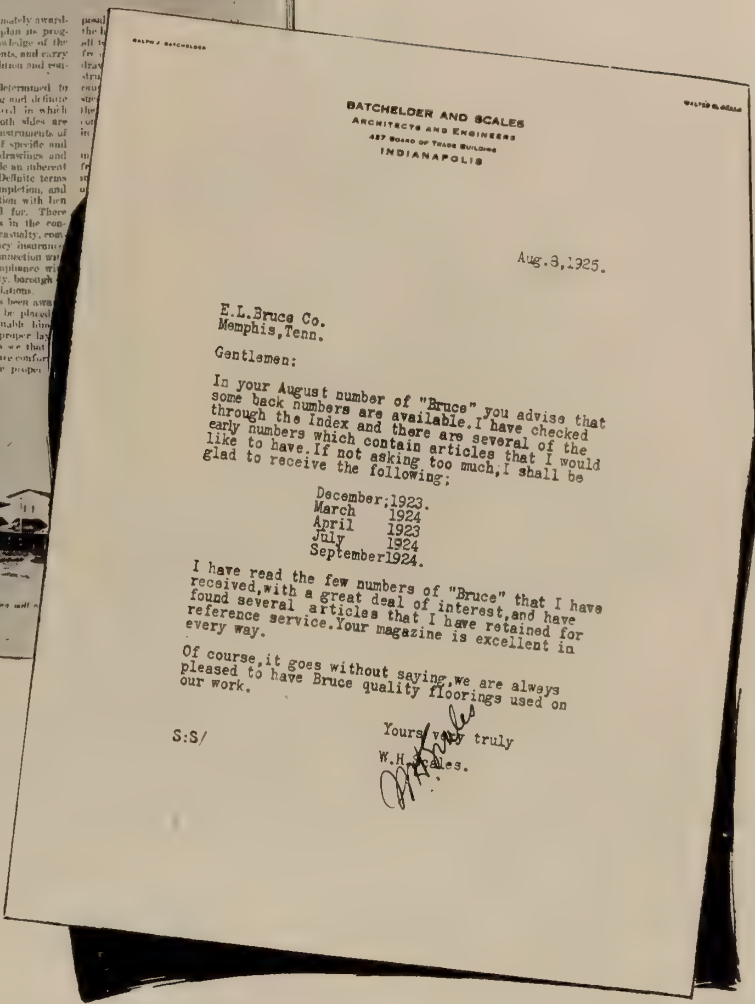
Name ....

Street ....

City .... State ....



One of the articles Mr. Scales wrote for. Reproduced from August, 1925, issue.



BATCHELDER AND SCALES
ARCHITECTS AND ENGINEERS
427 BOARD OF TRADE BUILDING
INDIANAPOLIS

Aug.3,1925.

E.L.Bruce Co.
Memphis,Tenn.

Gentlemen:

In your August number of "Bruce" you advise that some back numbers are available. I have checked through the Index and there are several of the early numbers which contain articles that I would like to have. If not asking too much, I shall be glad to receive the following;

December;1923.
March 1924
April 1923
July 1924
September1924.

I have read the few numbers of "Bruce" that I have received, with a great deal of interest, and have found several articles that I have retained for reference service. Your magazine is excellent in every way.

Of course, it goes without saying, we are always pleased to have Bruce quality floorings used on our work.

S:S/

Yours very truly
W.H.Scales.

Don't you agree with Mr. Scales?

The Bruce house organ is a compilation of suggestions and data invaluable to an architect, on any question dealing with oak flooring, hardwood lumber, and allied matters. While we are naturally interested in bringing to your attention the merits of Bruce products, selling talk is not obtrusive in this monthly publication. Articles are authoritative, informing, and useful to you.

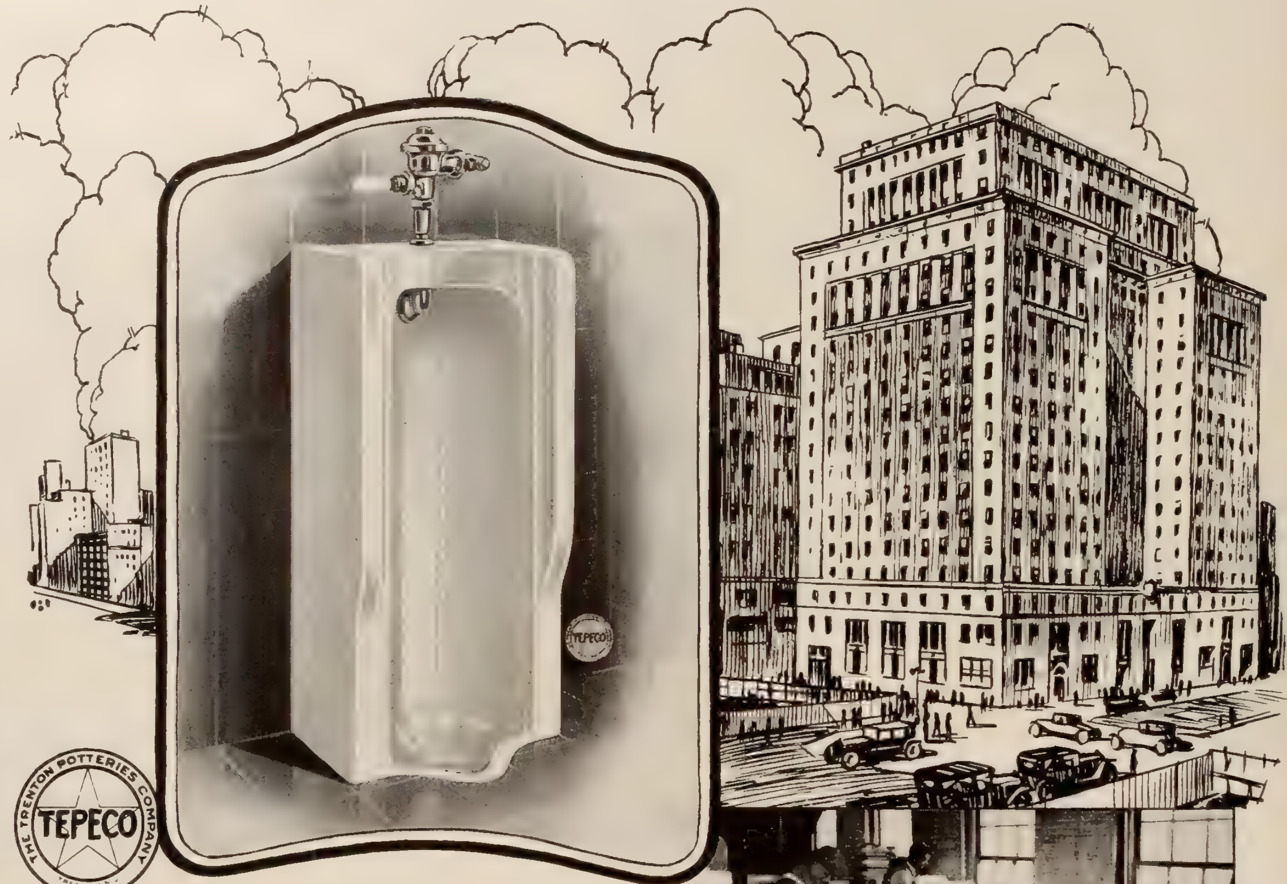
Here are a few subjects recently dealt with: Identifying characteristics of oak woods; Causes of cupped or shrunken floors; When special flooring lengths are unnecessary; New floors over old ones; Wax and Varnish finish; Rules for measuring and inspecting hardwood mouldings and finish; Standard lumber abbreviations; What is meant by hardwoods and softwoods, etc., etc.

We know you will enjoy receiving this magazine each month. It will be a pleasure to send it to you on request, without obligation. Simply write us.

Bruce oak flooring, and Bruce "Ceda'line", aromatic Tennessee cedar lining for clothes closets, are sold nationally through lumber dealers everywhere.

THIS book tells you about the convenience, economy and attractiveness of Bruce oak flooring. The ease with which it may be kept clean and bright; the enduring qualities; the increased value added to any home; appropriate use of various grades and widths, with practical suggestions for different rooms; distinctive effects which may be obtained from color finishes. 24 pages of interesting facts, fully illustrated. Write today for your free copy.

LARGEST MAKERS OF OAK FLOORING IN THE WORLD



Every "Tepeco" Urinal Stall is trued and fitted by an expert stone cutter.

Removing the Last Barrier to Perfect Sanitation

THE "Tepeco" line of Solid Porcelain and Vitreous China Urinal Stalls is made for single installations or in battery. The "Tepeco" method of interlocking stalls with separate seam covers does away entirely with the unsanitary space between stalls usually found in other installations.

Because of variations in height of urinals these seam covers are cut to fit each pair of stalls, and form clean, water-tight joints from wall to floor. This method also permits an easy and quick installation, the covers being placed in position after the stalls have been set. Single or in battery, the "Victory" stall is the perfect sanitary appointment for hotels, clubs and institutions.

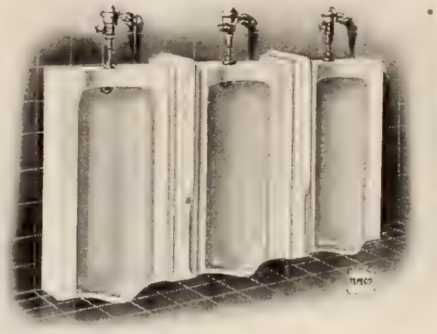


PLATE 3640-R

Showing 3-part battery of "Tepeco" Stalls. No catch corners for soil to collect.

The
TRENTON POTTERIES COMPANY
Trenton, New Jersey, U. S. A.
BOSTON NEW YORK SAN FRANCISCO
World's Largest Makers of All-Clay Plumbing Fixtures

TEPECO

ALL-CLAY PLUMBING FIXTURES

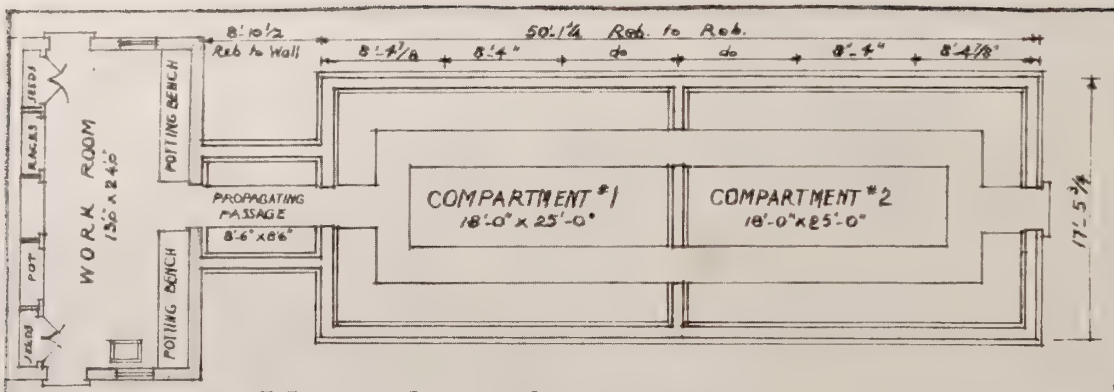
Residence of G. A. Weidhaas, Pelham Manor, New York. Roofed with IMPERIAL *Small Tapered Mission Tiles in a combination of Sage Brown, Fireflashed and Red.*

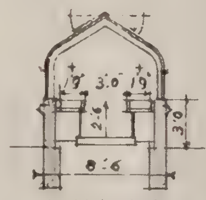
WHEN specifying IMPERIAL Roofing Tiles you do more than merely ward off wind and rain. For these tiles impart unrivalled beauty and impressiveness, keep the home cooler in summer and warmer in winter, and afford comforting protection from the ever-present menace of roof fires.

IMPERIAL
Roofing Tiles

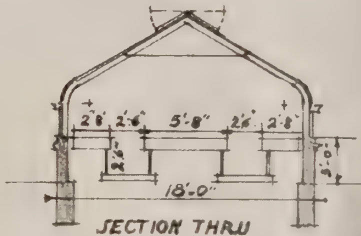
LUDOWICI-CELADON COMPANY

104 South Michigan Avenue · *Chicago*
565 Fifth Avenue · *New York*

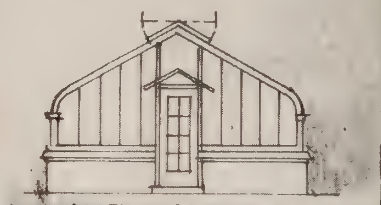




SECTION THRU PROP. PASSAGE



SECTION THRU COMPARTMENTS #1 & #2



NORTH WEST ELEVATION

Using the Offset Passage to Solve a Vexatious Problem

ONE of the problems of attaching glass enclosures to other buildings, is the frequent confliction of windows, likewise the resultant appearance of an after-thought or hitched-on effect.

Dwight James Baum in his linking of the Robert J. Law, Jr. Swimming Pool and Garage at Portchester, New York, completely solved the problem by using an offset passage. Such passages are admirable for propagating, or the growing of orchids, ferns and shade loving plants in general.

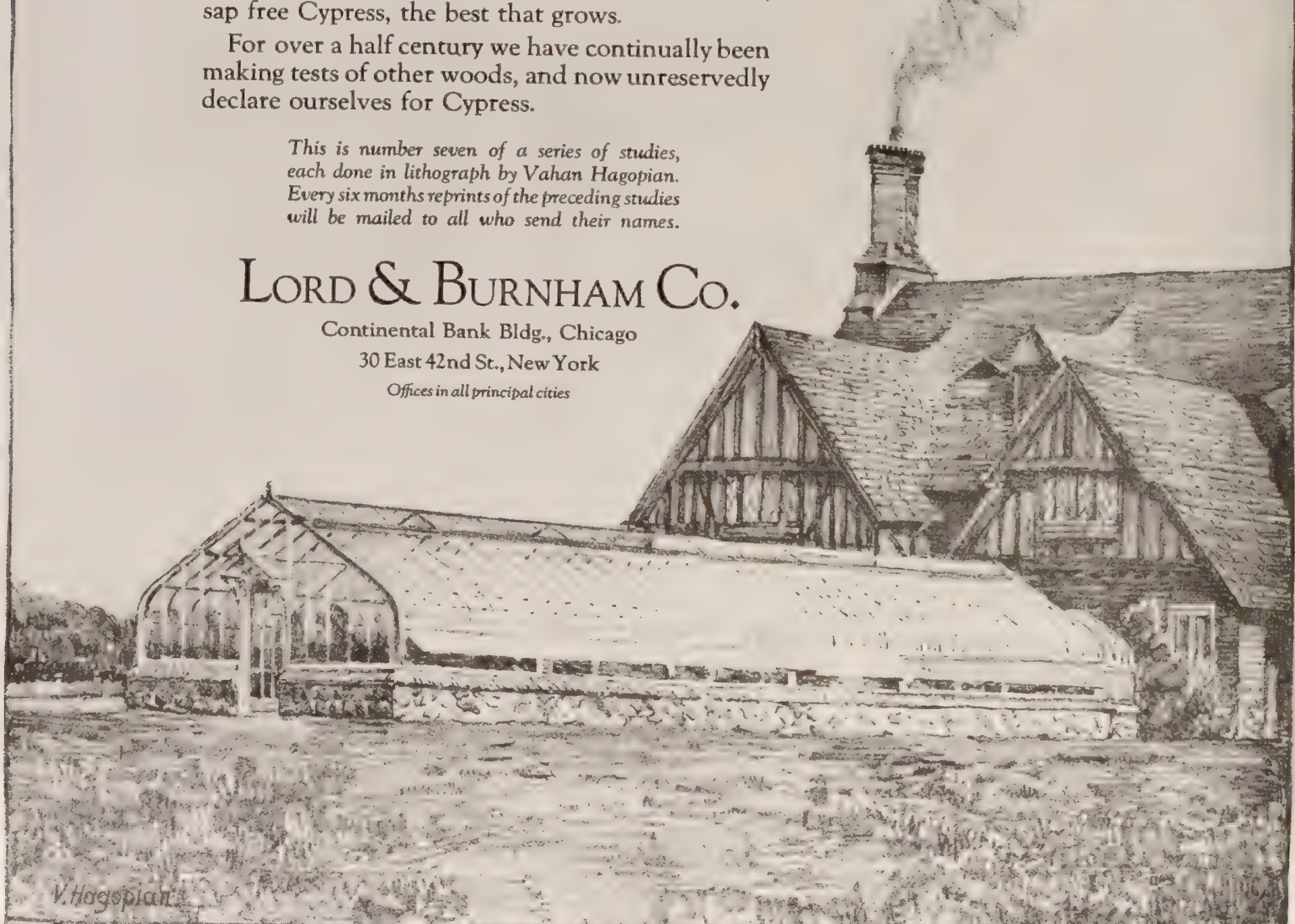
To all of which let us add, that no wood but Cypress is used in our houses. Tide-water, Red Gulf, sap free Cypress, the best that grows.

For over a half century we have continually been making tests of other woods, and now unreservedly declare ourselves for Cypress.

This is number seven of a series of studies, each done in lithograph by Vahan Hagopian. Every six months reprints of the preceding studies will be mailed to all who send their names.

LORD & BURNHAM CO.

Continental Bank Bldg., Chicago
30 East 42nd St., New York
Offices in all principal cities



GLASS ENCLOSURE STUDIES~PLATE No. 7

United States Naval Academy, Annapolis, Md. After eight years of hard and continuous service in this institution Moulding's T-M-B Floors (more than 100,000 sq. ft.) look like new.

Permanence Plus Comfort at Low Cost

Schools need floors of permanence and comfort that can be furnished at low cost and Moulding's T-M-B Flooring is successfully meeting these requirements in the classrooms and corridors of many schools and colleges throughout the United States and Canada.

Moulding's T-M-B Flooring is made of imperishable materials. Its durable, wear-resisting quality is not restricted to the top surface, but continues uniform throughout its full thickness. It never wears gritty, and always has a smooth velvet-like surface. Moulding's T-M-B Flooring never rots, and forever retains its original life and texture. It never buckles, shrinks, or cracks, and when laid it becomes an integral part of the building. Its colors never fade.

Moulding's T-M-B Flooring has a resilient rubber-like surface, smooth and quiet under foot and it is never slippery. Installed in plastic form it is seamless and sanitary and offers no refuge for germs or vermin. It is dustless and is easy to clean.

On cement foundations the initial cost of Moulding's T-M-B Flooring, installed complete by us, is from twenty to twenty-five cents per square foot, for average areas. It can be kept like new year in and year out at practically no cost.

Moulding's T-M-B Flooring stands the test of time and use. Its merit has been proved by years and years of service under constant foot traffic and it is today being specified for schools and colleges everywhere. Write us for complete information.

Made and Laid Anywhere in United States and Canada by

Recent Installations:

Memorial High School
Wilkesbarre, Pa.
30,000 sq. ft.

Warren G. Harding High School
Bridgeport, Conn.
55,000 sq. ft.

Thos. F. Bayard School
Wilmington, Delaware
20,000 sq. ft.

Claymont School
Claymont, Delaware
7,000 sq. ft.

Union Free School
Valley Stream, Long Island, N. Y.
11,000 sq. ft.

Mitchell High School
Denver, Colo.
17,000 sq. ft.

Southwestern University
Memphis, Tenn.
40,000 sq. ft.

University of Louisiana
Baton Rouge, La.
55,000 sq. ft.

MOULDING'S

T-M-B

FLOORING

THOS MOULDING BRICK COMPANY

Over 60 Years of Responsibility and Financial Stability

133 West Washington Street
Chicago, Illinois

Grand Central Terminal Building
New York City

"PITTSBURGH" IN YOUR SHOW WINDOW LIGHTING SPECIFICATIONS MEANS—

Why "Pittsburgh" *Silvered* REFLECTORS STAY BRIGHT

First, the crystal glass reflector is plated with silver. Then a copper plating is laid over the silver. Finally the silver-colored satin finish is applied over the copper. Thus the silvered reflecting surface is sealed in between the glass and the copper, insuring undimmed reflecting power through a long term of years.

Reflectors That Do Not Tarnish;

A 9-Year Record to Substantiate This Statement;

A 5-Year Guarantee to Clinch it.

OUR engineering department is at your service in connection with your show window or cove lighting jobs. For almost twenty years we have specialized in this field.

In addition to obtaining a fund of information and experience, we have been so fortunate as to develop a reflector that is practically perfect.

Although "Pittsburgh" Reflectors carry a five-year guarantee, not one made since we first used the coppering process (August 1, 1916) over nine years ago, has ever been reported to us as having the silvered reflecting surface tarnish or discolor or the backing crack, check or peel.

We will be glad to send a copy of our booklet—"Show Window Lighting"—free on request.

PITTSBURGH REFLECTOR COMPANY
410 Bowman Bldg. Third and Ross Streets
PITTSBURGH, PA.
REPRESENTATIVES IN PRINCIPAL CITIES

METTOWEE STONE from the PENRHYN HILLS

"Mettowee Stone" floor in the Palmer Lodge Apartments, Detroit Wiedemier & Chesnou, Architects

Mettowee Stone—The Floor with Texture

METTOWEE STONE should be laid from a plan—a carefully designed scheme so that the charming natural colors may be displayed in their full splendor.

Our Architectural Department will give you the benefit of their experience without obligation. Loan us your plans for a day or two. They will be returned promptly with our suggestions and quotations.

·VENDOR · SLATE · C^o^·
OF EASTON, PENNSYLVANIA
ARCHITECTURAL DEPARTMENT
101 PARK AVENUE, NEW YORK, N. Y.

No surface that can be scoured off is fit for bathroom equipment

A SURFACE that must be scoured to clean it is comparatively soft. And the process of scouring involves the removal of particles of the surface itself, by friction and abrasion.

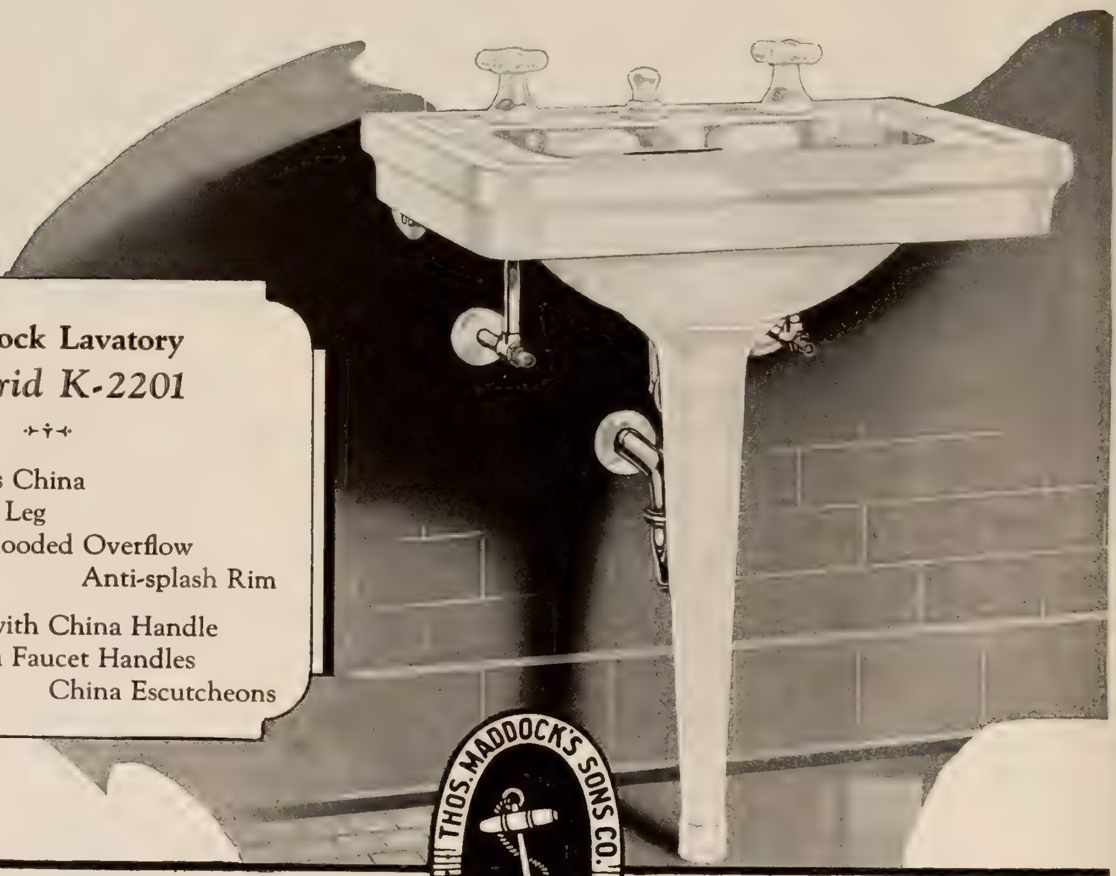
The first scouring causes a myriad of microscopic scratches to develop. Thus roughened, the surface holds soil more than before. And so must follow an endless series of scourings, increasingly necessary as the surface becomes more and more roughened.

No housewife ever finds it necessary to scour a china plate; no scouring could clean it better than soap and water. Scouring could not hurt it, but it would do no good.

Vitreous china bathroom equipment, likewise, is cleansed thoroughly with soap and water. It does not hold soil, and it never requires scouring. The surface is so hard and non-porous that nothing can penetrate it. Soil cannot become "grimed in"; acids cannot eat into it. It will not become scratched in use.

And so, vitreous china is the one material really fit for bathroom equipment. It sheds soil; it harbors no microbes; it retains no odors; it is truly sanitary; it is permanently snow-white and glassy-smooth.

Write us for as many copies as you can use of our new booklet, "Maddock Bathrooms." They will help you to "sell" clients on quality fixtures, and make them more appreciative of such fixtures when recommended. There will be no charge for the booklets.



Maddock Lavatory
Madrid K-2201

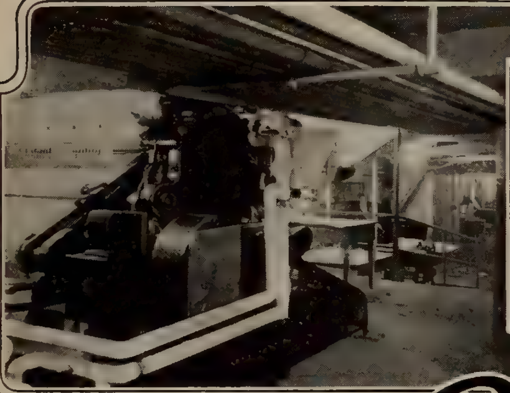
White Vitreous China
Sanitary Leg
Hooded Overflow
Anti-splash Rim

Pop-up Waste with China Handle
China Faucet Handles
China Escutcheons

THOMAS MADDOCK'S SONS COMPANY, *Trenton, N.J.*

THOS. MADDOCK'S SONS CO. TRENTON, N.J.

MADDOCK
Bathroom Equipment



View in the laundry, showing part of the thousands of feet of pipe required in this Apartment.

APARTMENT HOTEL
277 PARK AVENUE
NEW YORK CITY

ARCHITECTS
McKim, Mead and White

PLUMBING CONTRACTORS
Geo. E. Gibson Company

HEATING CONTRACTORS
Thompson-Starrett Company

View of the court and gardens—approximately one hundred feet wide by three hundred feet long.

Character of Installation

- a measure of pipe values

The fact that a product is continually specified and installed over a period of years speaks more for its merit than any claims that could be made by the manufacturer—especially when specified and installed by architects, engineers and contractors so high in their profession or business as those who plan and build structures of the character of this Apartment Hotel.

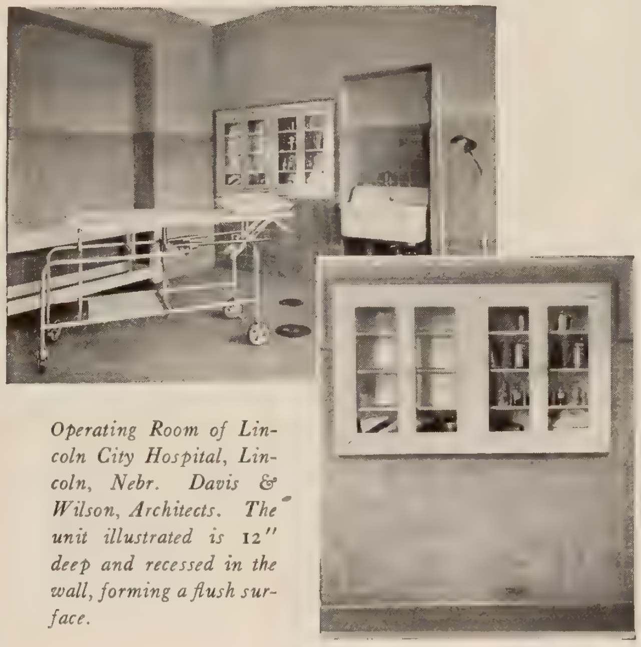
In a building of this size and importance, where the piping requirements are enormous—running into several hundred tons—it is especially significant to those interested in similar projects that "NATIONAL" Pipe was selected for the major requirements of this building, one of the finest of its kind in the country. Other large and important buildings in which "NATIONAL" Pipe has been installed are shown in "NATIONAL" Bulletin No. 25. This publication contains useful data on pipe for building purposes. A copy will be sent upon request.

NATIONAL TUBE COMPANY, PITTSBURGH, PA.
DISTRICT SALES OFFICES IN THE LARGER CITIES

The WHITE HOUSE Line

TRADE MARK

SECTIONAL UNIT STEEL DRESSERS



Operating Room of Lincoln City Hospital, Lincoln, Nebr. Davis & Wilson, Architects. The unit illustrated is 12" deep and recessed in the wall, forming a flush surface.

The Modern Hospital Requires Steel Units

From Operating Room to Kitchen, the modern hospital is fully equipped with Steel Units. Old fashioned wooden cabinets, cupboards and closets are things of the past.

WHITE HOUSE Units are fire-proof, moisture-proof, vermin-proof and absolutely sanitary. They fulfil the exacting needs of hospitals where unusual durability and sanitation are essential. They are all standard units—no special work is required in making or installing them. Catalogue upon request.

JANES & KIRTLAND, Inc.

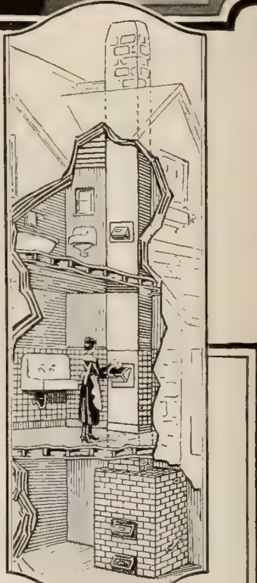
Established 1840

135 West 44th Street New York City

Kernerator equipped residence of Mr. H. W. Kanouse, Lochmoor Blvd., Grosse Pointe Shores, Michigan: architect, Aloys F. Herman.

Pays!

—architect
—builder
—owner
—tenant



By banishing permanently the old-fashioned, unsanitary, garbage can and rubbish pile, the time-tried Kernerator PAYS, unmistakably, all concerned in building.

Pays the architect, because it is a safe, sure, standard-practice recommendation, that through happy experience is a credit to his sound judgment—

Pays the builder, because installation is simple, proper functioning 100 per cent guaranteed, and satisfaction assured—

Pays the owner, because it returns his investment many times over in convenience, in garbage can replacements, in absence of vermin, in sanitation, in reduced tenant-turnover—

Pays the tenant in freedom from all the annoyances incident to antiquated waste and garbage disposal methods.

Costs Nothing to Operate— No Fuel Needed

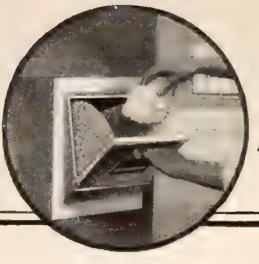
The Kernerator consists of a brick combustion chamber, in the basement, with handy hopper doors located in the flue, in or near the kitchen. All waste—garbage, tin cans, bottles, papers, rubbish of all kinds—is simply dropped through the handy hopper door. An occasional lighting burns everything but metallic objects and like non-combustibles, which are flame-sterilized for removal with the ashes. No fuel used—the waste itself is fuel for its own destruction.

Above is shown a typical Kernerator residence installation. The Kernerator (which ***must*** *be built-in, as it cannot be installed later) costs no more than a good radio set.*

For details, consult Sweet's (1924) Pages 2536-37, or write—

KERNER INCINERATOR COMPANY
711 EAST WATER STREET MILWAUKEE, WIS.

KERNERATOR
Built-in-the-Chimney
Reg. U S Patent Office



Drop all waste here *—then FORGET it!*

HORN-WATER-PROOFINGS

On The Chicago Union Station

GRAHAM, ANDERSON, PROBST AND WHITE,
Architects

All window frames are caulked, and the parapet coping and walls are pointed with the everlasting elastic cement

VULCATEX

VULCATEX
An elastic, everlasting cement forming a perfect bond between all structural materials. It never hardens. Always stays tight. Its use is a part of standard specification of National Terra Cotta Association.

DEHYDRATINES
Are thoroughly dependable, liquid or plastic compounds for every water-proofing, damp-proofing and stain-proofing need. We suit the method to conditions, and the material to the method.

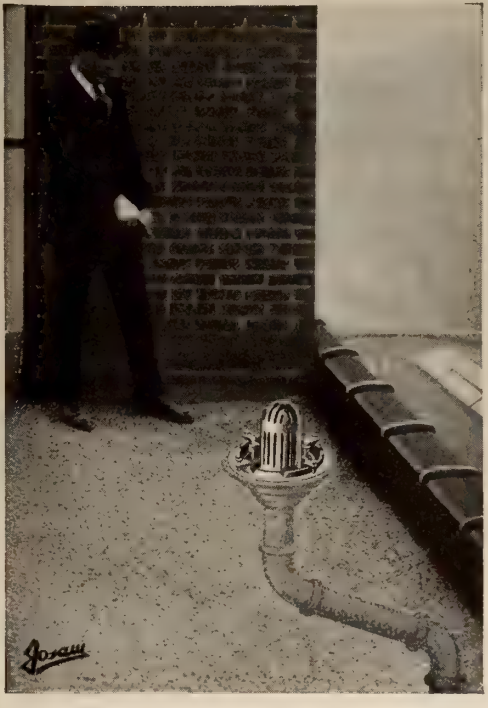
HYDRATITE
Water-proofs concrete and cement mortars integrally and permanently. Used in mortar joints — stucco — foundations and floors.

A.C. Horn Company

LONG ISLAND CITY, N.Y.
310 Horn Building

Josam on the Roof

Josam DRAINS TRADE MARK REG. STANDARD OF AMERICA



When Josam 400 S Roof Drain is used leaks around the drain cannot occur. The Josam improved clamping device holds the roofing membrane firmly in place, eliminates the use of flashing and assures a positively water tight connection. The combined removable sediment cup and dome strainer make cleaning easy. Also furnished with Josam Double Drainage Flange (400 BS).

There is a Josam Roof Drain for every purpose.

If you do not have a copy of our latest catalogue write for it today.

Josam Drains are sold by all plumbing and heating jobbers.

"There are no substitutes for Josam Products."

THE JOSAM MANUFACTURING CO.

Sales Office:
4910 Euclid Building
Cleveland, Ohio

Factory:
Canal Rd. & L. E. & W. R.R.
Michigan City, Ind.

Fort Worth Club Building
Fort Worth, Texas
Architects: Sanguinet, Staats & Hedrick

"A Thousand Owners to be Pleased"

CLUB buildings are particularly exacting jobs because, as one architect puts it, "there are a thousand owners to be pleased."

Satisfactory operation of elevator doors has been permanently assured to the "thousand owners" of the Fort Worth Club Building through the selection of Wagner Elevator-door Hangers.

The installation of Wagner Hangers, Closers and Electric Safety Interlocks is a positive guarantee that every elevator door will open easily, close quickly and operate with absolute safety.

Is complete Wagner data available in your files? If not, write

Wagner Manufacturing Co.
Cedar Falls, Iowa

WAGNER
ELEVATOR DOOR HANGERS, DOOR CLOSERS, ELECTRIC SAFETY INTERLOCKS

WAGNER HANGERS
Used the World Over

Mr. Pond's New Book

Simple Engineering Problems *for* Architects

will be ready shortly. 16*mo.* $1.50 *net*

Other useful office helps by the same author

Drafting-Room Mathematics $2.50

Problems of the Drafting-Room simply and clearly explained.

Concrete Construction for Architects

The only book on the subject written for the Architect. $4.00

Charles Scribner's Sons, *Publishers*
New York

Homeopathic Hospital, Providence, R. I., in which Ambluco Treads and Landings were installed. Kendall Taylor & Co. were the architects.

The Ambluco Non-Slip Blue Stone Stair Treads and Landings

SANITARY AND QUIET

IN keeping with the design, workmanship and high quality of materials of this masterpiece of Hospitals, the architects, Messrs. Kendall Taylor & Co., further displayed their discriminating judgment by using AMBLUCO NON-SLIP STAIR TREADS AND LANDINGS.

As has well been proven in many hospitals for upward of 15 years, these durable Treads always continue non-slip whether wet or dry, do not produce dust, and, having a uniformly even surface free from ribs and grooves to trip over and collect filth, are easily kept clean. Also they are quiet—an essential quality where there are so many human beings undergoing great suffering, and yet one that is rarely found in natural stone treads, and practically never in artificial treads which come loose and rattle.

AMERICAN BLUE STONE CO.

AMERICAN BLUE STONE COMPANY AMBLUCO

Reg. U. S. Pat. Office

CONSULTING *and* SALES OFFICE
1 MADISON AVE.
NEW YORK

Detroit Graphite Company

DETROIT, U. S. A.

DEGRACO PAINTS
All Colors for Your Particular Needs

Superior Graphite Paint—for the prevention of rust.
Sta-White—Interior white paint that stays white.
Degraco Wall Finishes.
Building Paints in all colors.
Brick & Concrete Paints.

See Sweet's Catalogue for specification data.

Offices and warehouse stocks in all principal cities

Simpler, quicker and cheaper concrete construction

THAT'S what GF Self-Sentering has made possible. That's also why it is in general use for roofs, ceilings, floors, sidewalls, mezzanine floors, balconies, curtain walls, sidewalk vaults and innumerable other construction jobs once considered too difficult and costly for concrete.

Self-Sentering is at once, both form and reinforcement. It is remarkably flexible. So it can be used as easily for curved walls, domed, saw-tooth and odd shaped roofs as for straight-away flat construction. Moreover, it insures not only construction that is economical, but also fireproof and permanent.

If you are not entirely familiar with Self-Sentering, write for the "GF Fireproofing Handbook." It will give you the latest authoritative information on fireproof reinforced concrete construction. We will gladly send it free.

THE GENERAL FIREPROOFING BUILDING PRODUCTS
Youngstown, Ohio

Branches: New York · Chicago · Philadelphia · Boston · Cleveland
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Export Department: 90 West Street, New York City
Cable Address: "Firegen-New York" · *Dealers Everywhere*

GF Self-Sentering
A Combined Form and Reinforcement

THE GENERAL FIREPROOFING BUILDING PRODUCTS
Youngstown, Ohio
You may send me gratis a copy of the "GF Fireproofing Handbook."

Name ....
Address ....
City .... *State* ....

Vue Prise a l'Ouest
de l'Opera, Paris

An Interesting Detail in BRONZE

This treatment shows an effective use of ornamental BRONZE in giving character to the building.

COPPER & BRASS
RESEARCH ASSOCIATION
25 Broadway - New York

F. Rogers & Sons Department Store, 400 East Fordham Road, New York, Townsend, Steinle and Haskell, Architects; C. H. Meyn, Inc., Plasterers. DURASTONE BRAND Caen Stone was used throughout the interior and in the show windows.

DURASTONE BRAND

LIMESTONE, CAEN STONE, TRAVERTINE INTERIOR AND EXTERIOR FINISHES

Durastone Brand Cement adapts itself to the most intricate treatment with ease. It may be used in the interior of any building that is constructed with an eye to beauty, durability, and economy. As Durastone is made in different shades of the various stones, one can have a perfect match of stones. Every shade and texture of the most expensive stone is carefully reproduced.

THE DURASTONE COMPANY, Inc.

1105
METROPOLITAN
AVENUE

SAMPLES
DISPLAYED
WITH
ARCHITECTS SAMPLES
CORPORATION
NEW YORK NY

BROOKLYN,
N. Y.

LUTTON V-BAR
Quality Greenhouses

Beautiful—
Economical—
Lasting—

Interior of EMIL WINTER'S V-BAR greenhouse, Pittsburgh, Pa.

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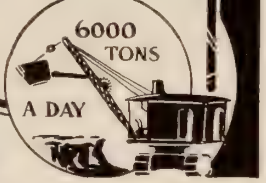

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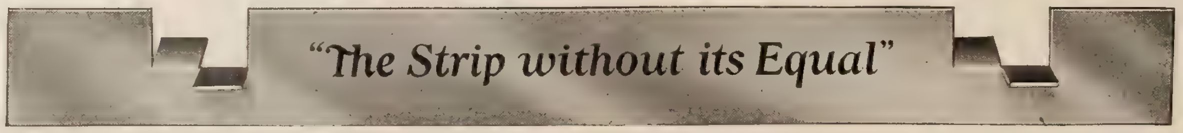
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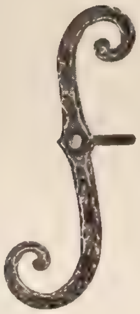

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Fig. 157

Note the construction of patent Interlocking Device used on Edwards Metal Shingles and Spanish Tile

Fig. 367

Metal Spanish Tile for main part of roof.

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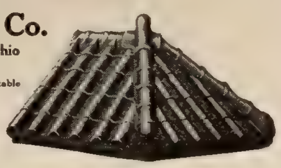

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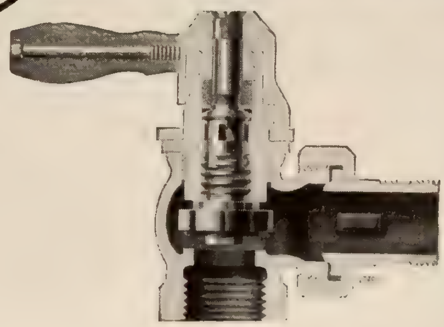

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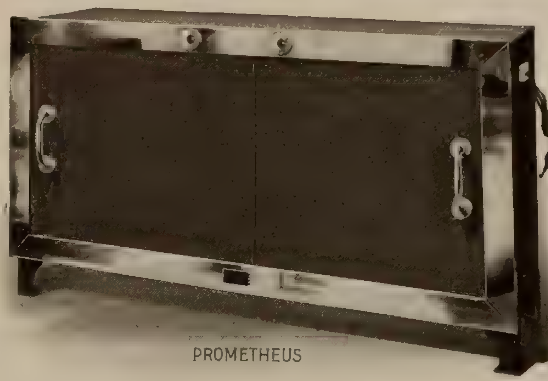

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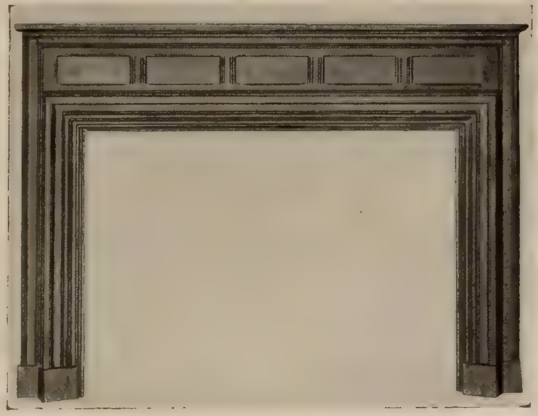

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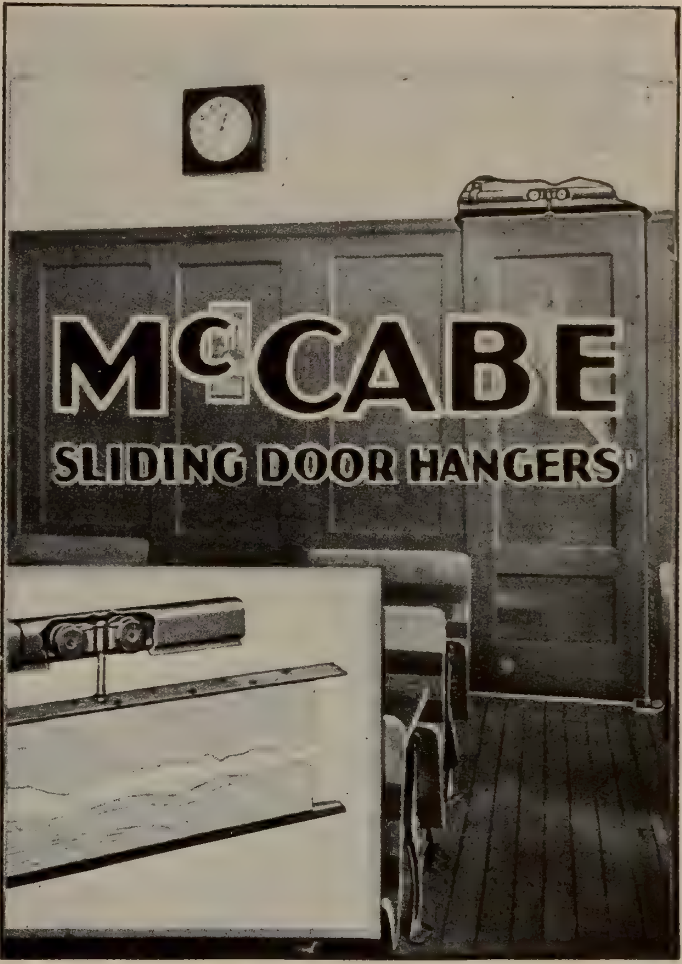

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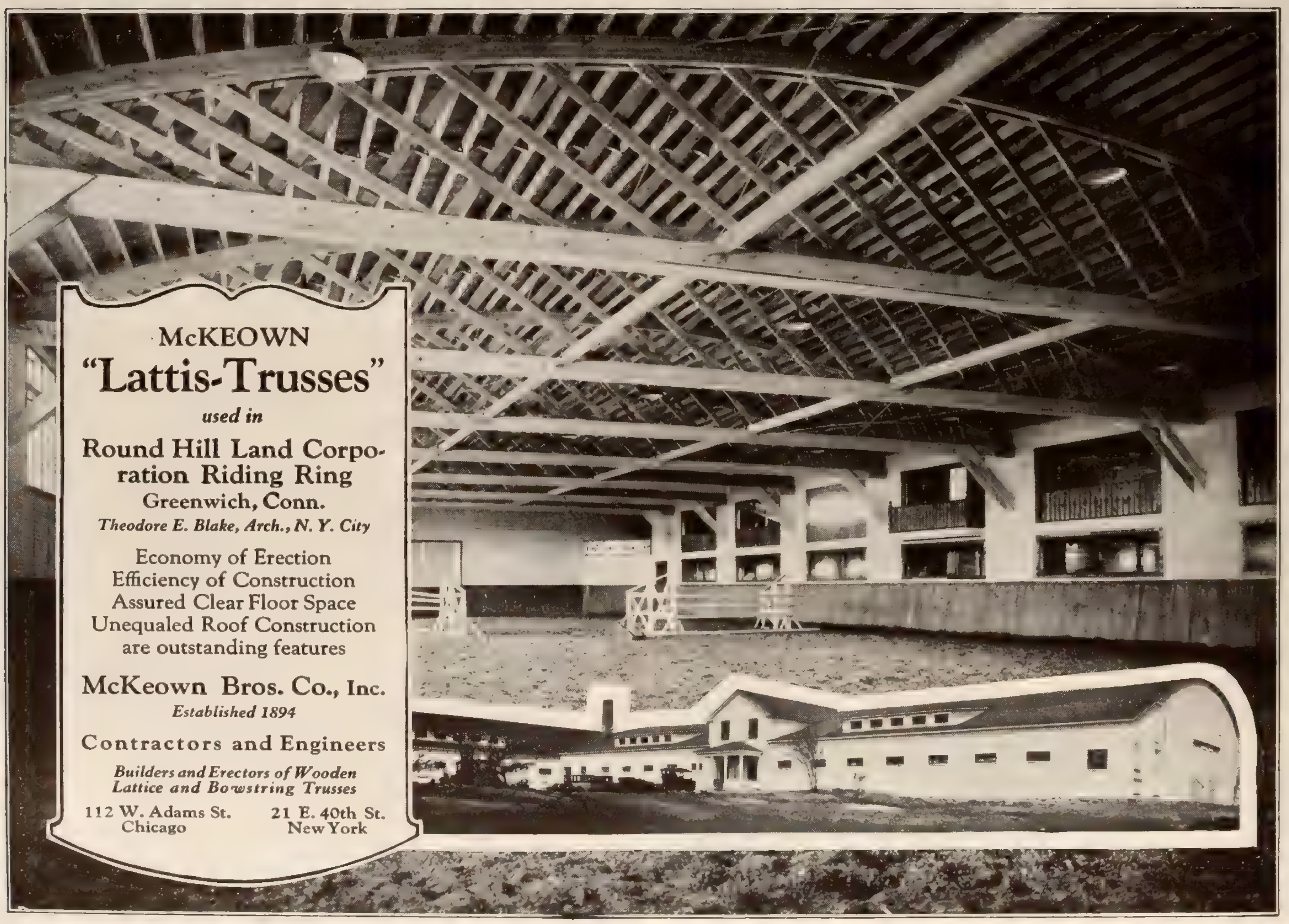

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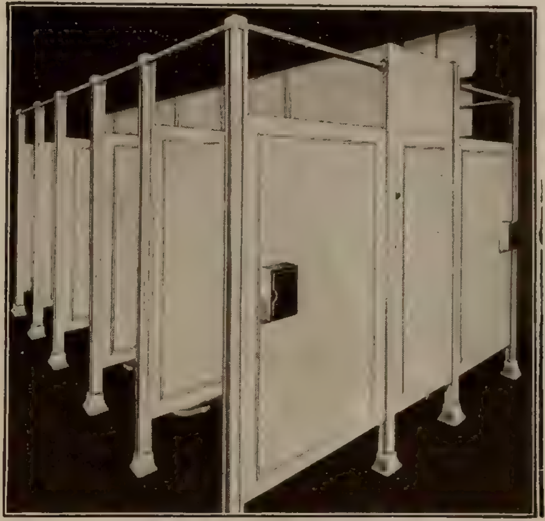

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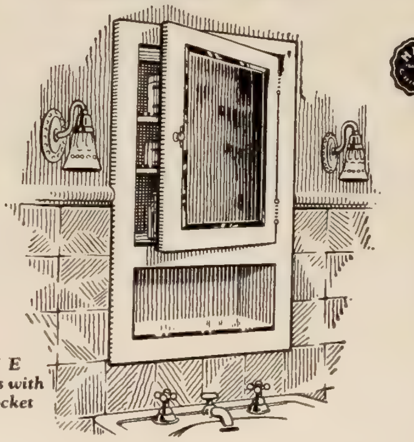

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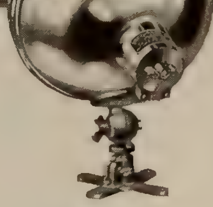

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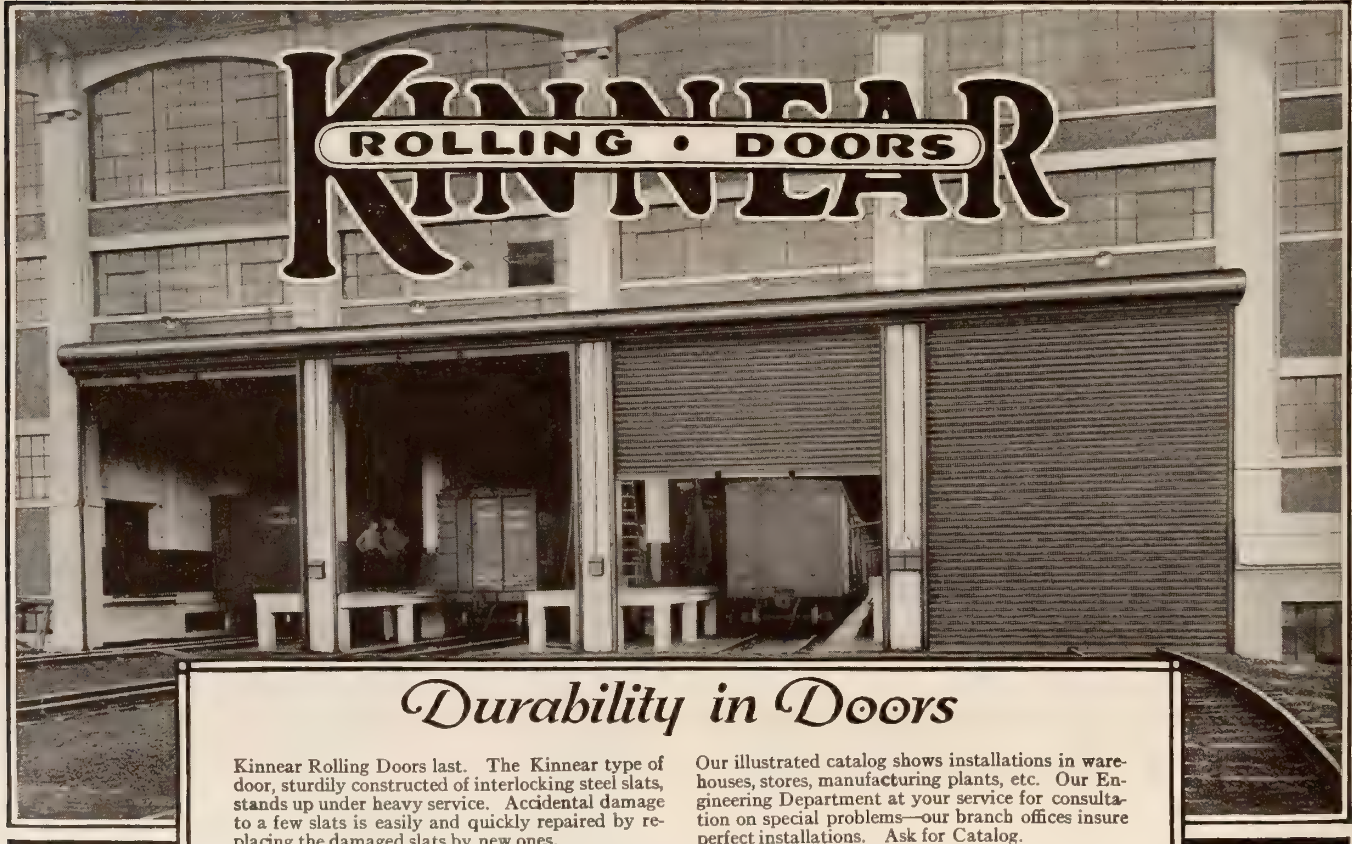

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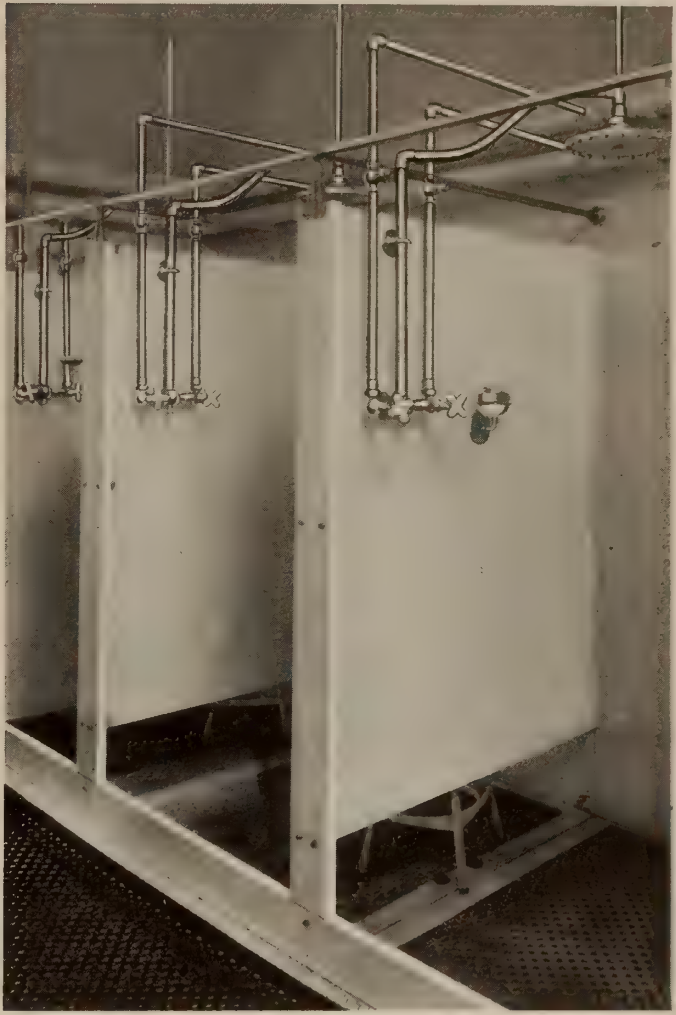

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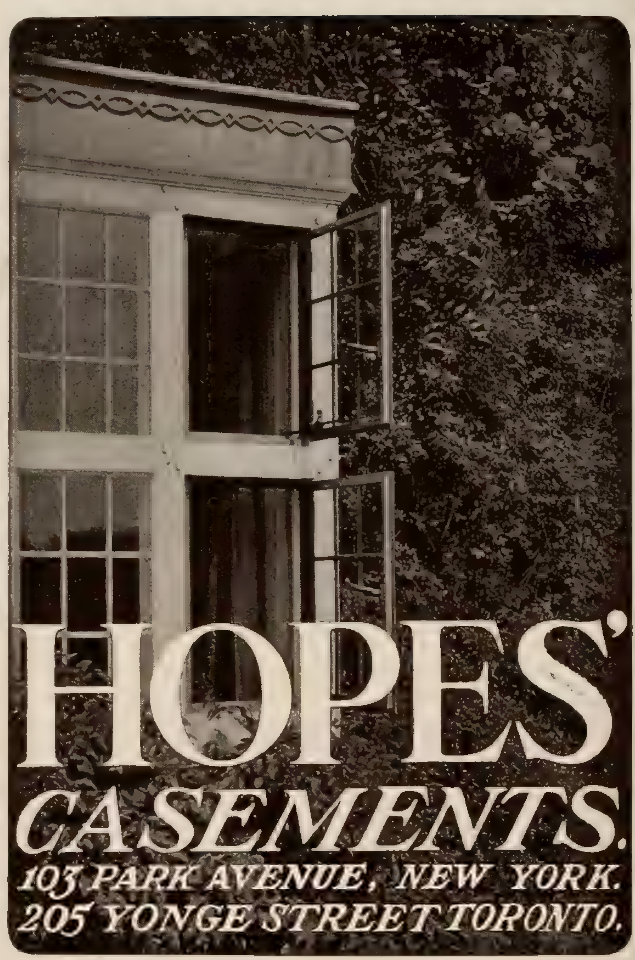

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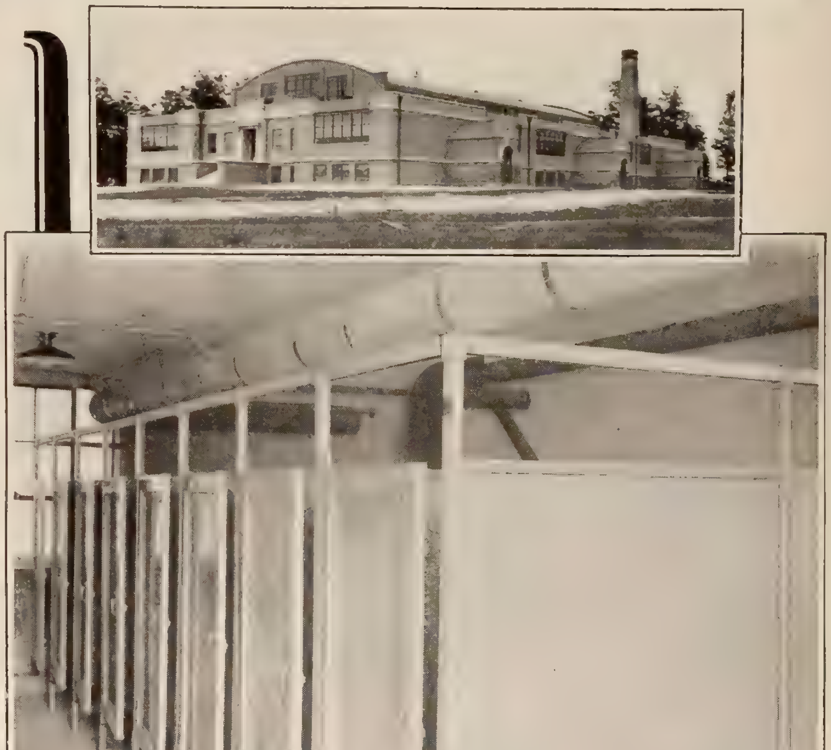

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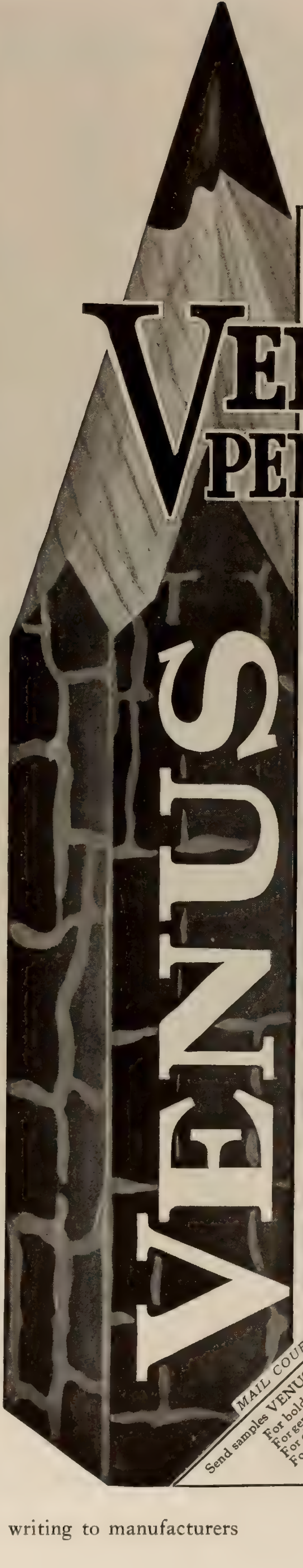

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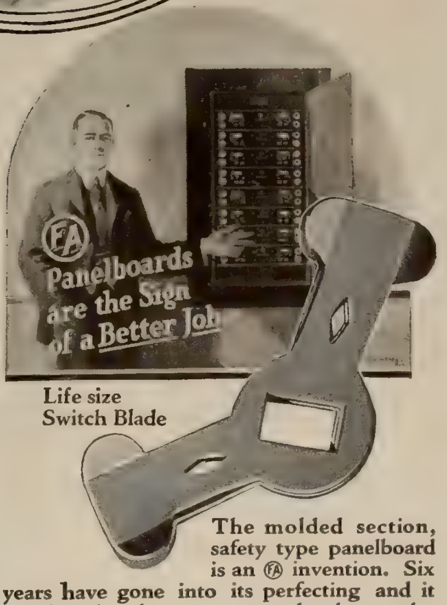

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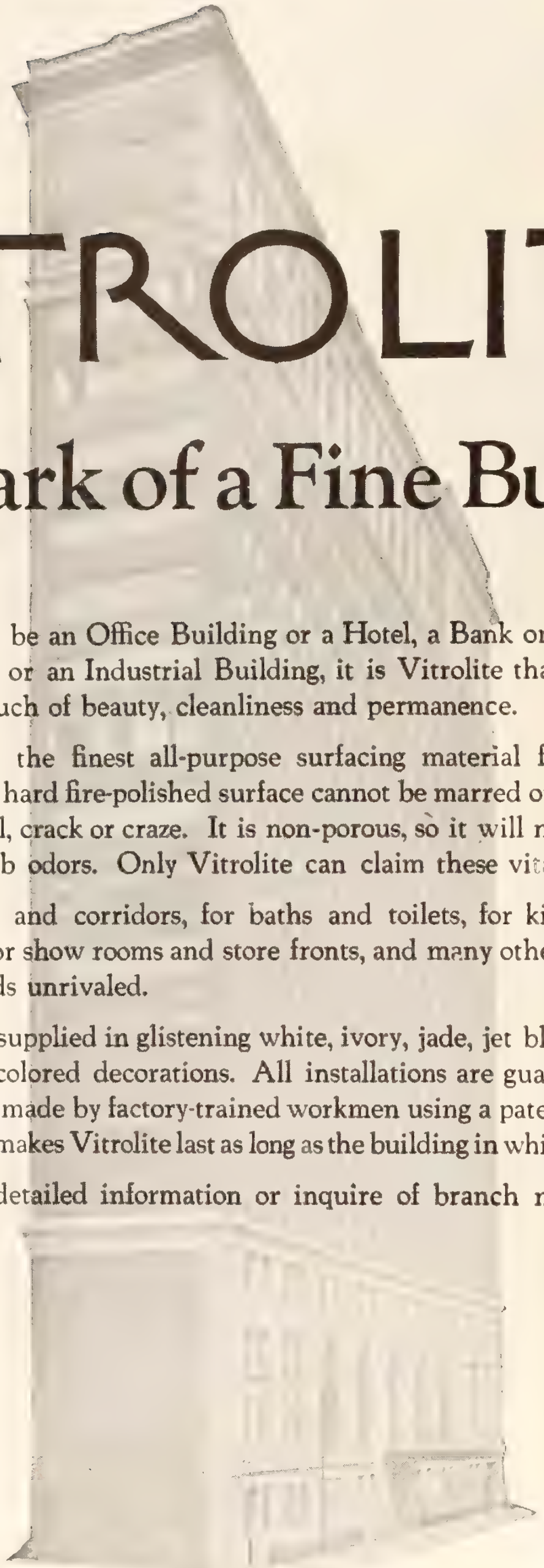

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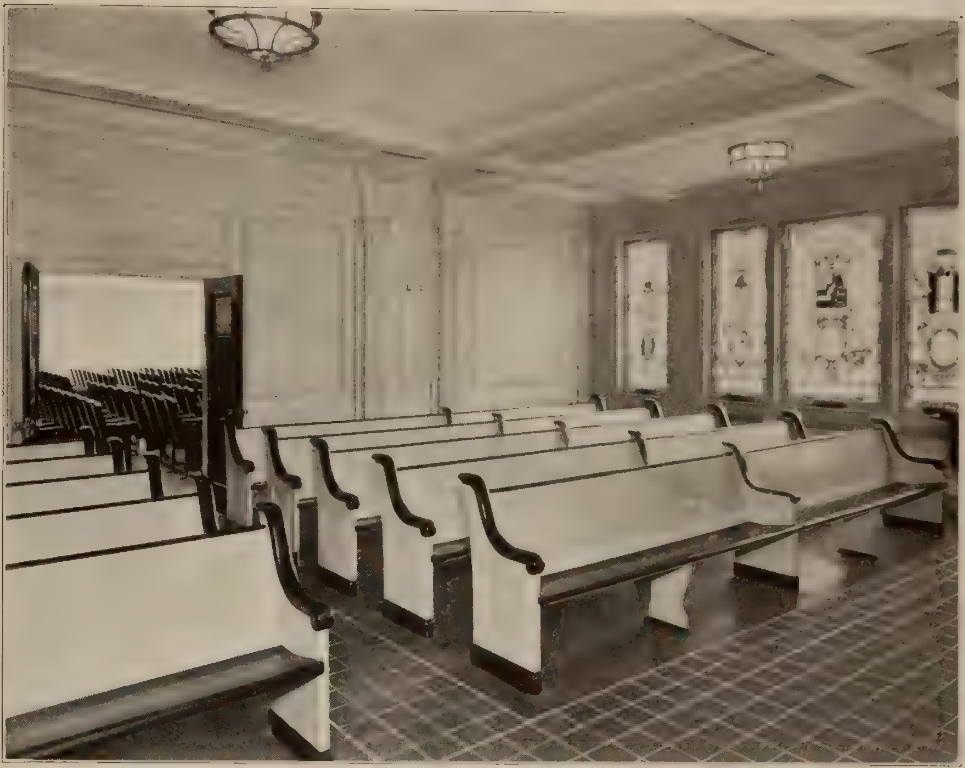

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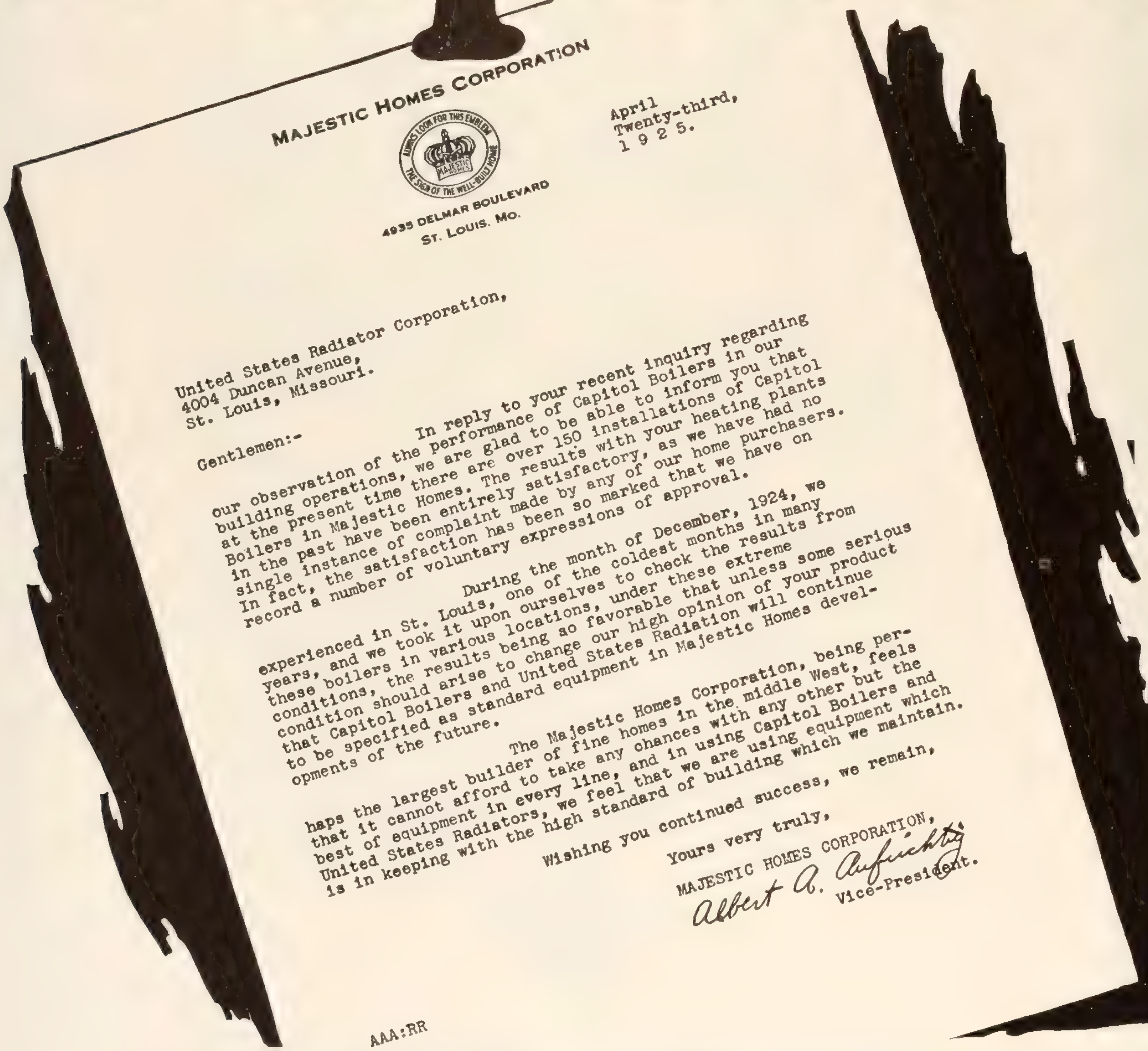

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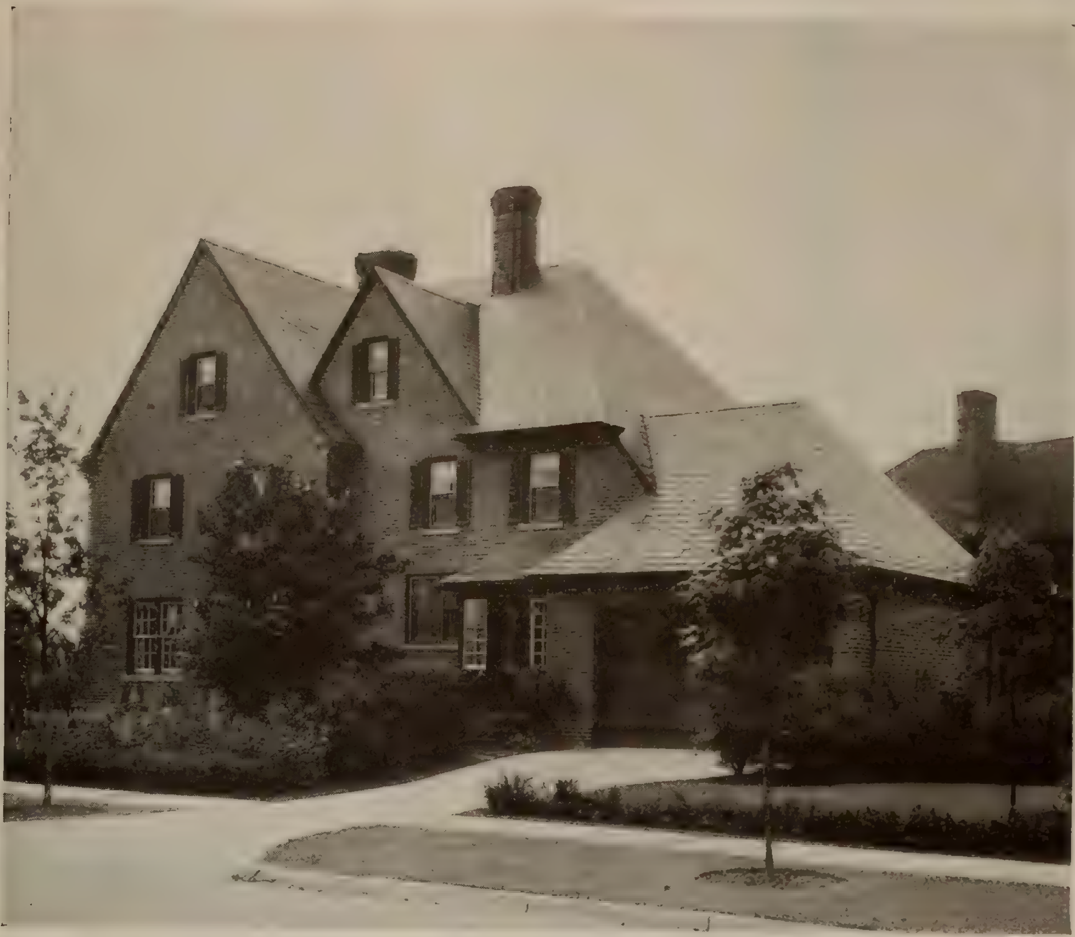
Boilers



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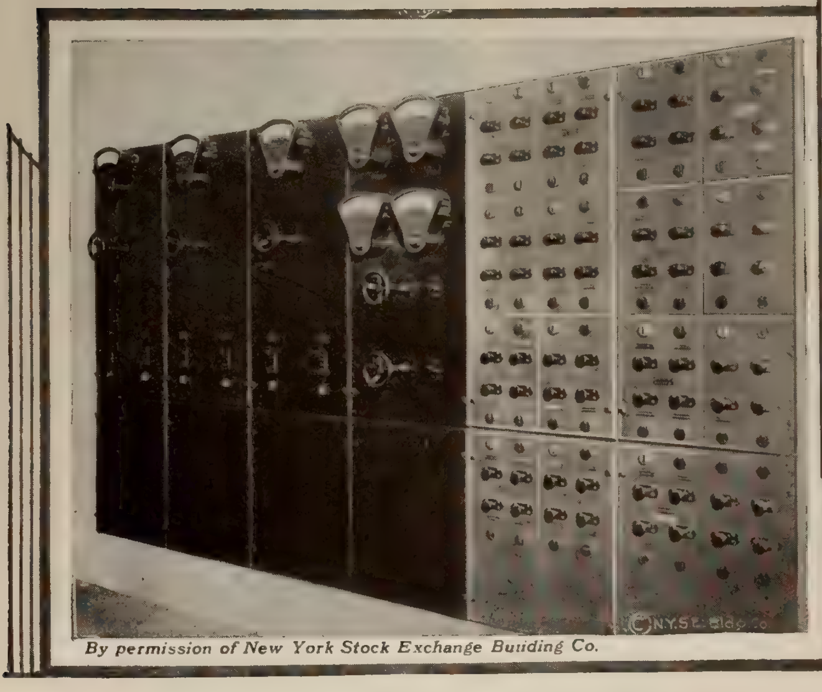

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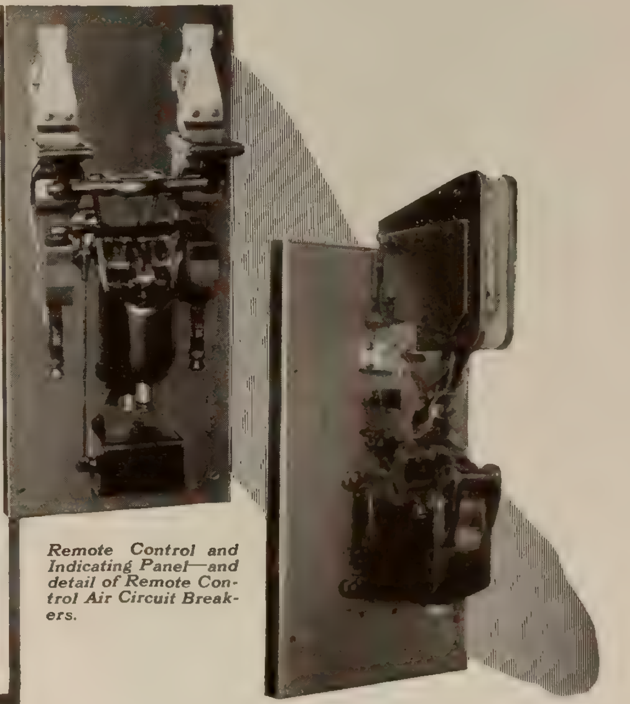

Remote Control and Indicating Panel—and detail of Remote Control Air Circuit Breakers.

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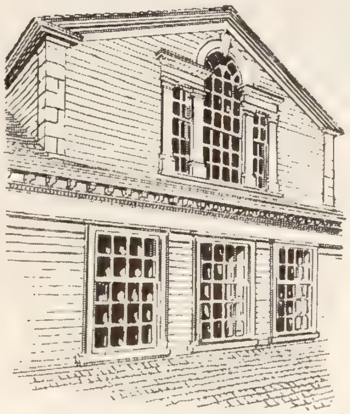
Portico details, Rumford House



Detail of Palladian Window, Rumford House

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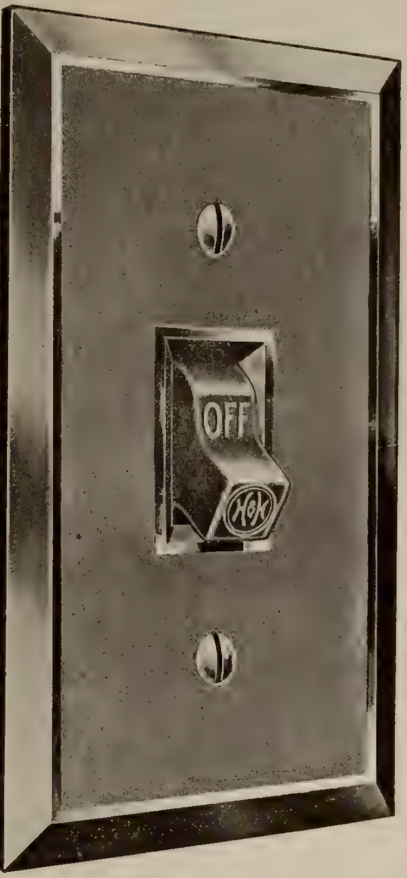

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Warren & Wetmore, Architects, New York
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Better Doors mean Better Refrigeration

THE above photograph shows the second plant built by the Merchants Refrigerating Company of New York City.

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3	**Jamison Standard Fire-proof Cooler Doors**
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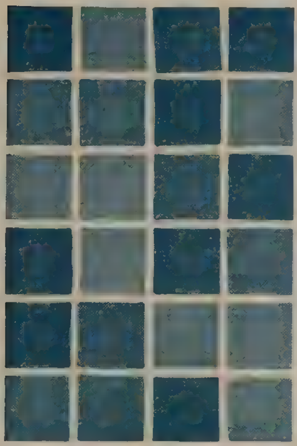


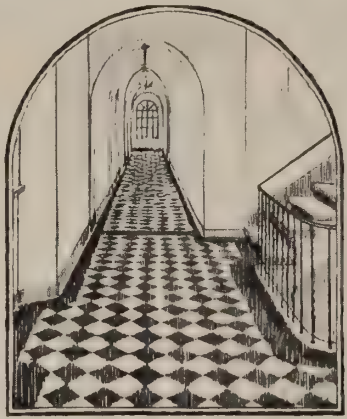
Straight Line Inlaid No. 285, with border of Plain Black No. 27

Moulded Inlaid No. 3041

Few fine floors of lasting beauty cost so little and look so well as modern linoleum

TODAY architects and decorators plan interiors with the floor as the basis of the whole color scheme. And happily so. For modern decoration demands floors that are bright, colorful, a basic part of well-planned rooms.

And the new patterned floors of Armstrong's Linoleum meet this growing vogue. There are handcraft tiles with rich shadings of color. There are natural marble effects. There are bold block patterns in black and cream. There are skillfully rippled jaspés in gray, green, blue, and brown. There are graceful geometric designs and colorful Dutch tiles. There are many other beautiful patterns, each a source of inspiration to the architect.



A corridor in the Cloister Apartments, San Francisco, Henry C. Smith, Architect. Note the dignified beauty of this floor of Armstrong's Linoleum.

Today these artistic patterned floors are being used in many kinds of buildings. The hospital, hotel, or other public building—the retail shop—the business or professional office—the apartment house or private home—these are interiors that need the decorative note provided by floors of color and design.

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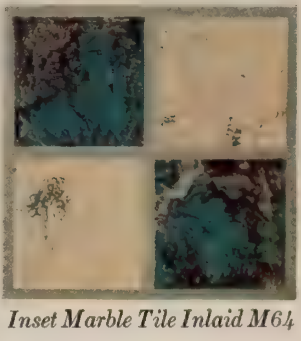
When you want suggestions regarding interior color schemes inspired by floors of color and design, write to the Armstrong Bureau of Interior Decoration. This service bureau, supervised by a skilled interior decorator, is always at your disposal, without charge or obligation. Samples also may be had free upon request.



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Linoleum Division — Lancaster, Penna.

Armstrong's Linoleum *for every floor in the house*

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Brutus Gundlach, Architect
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HEALTH HEAT

for Large Country Residences

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DURABILITY

It is the heaviest heater made and Kelseys installed 30 years ago are still giving good service.

KELSEY
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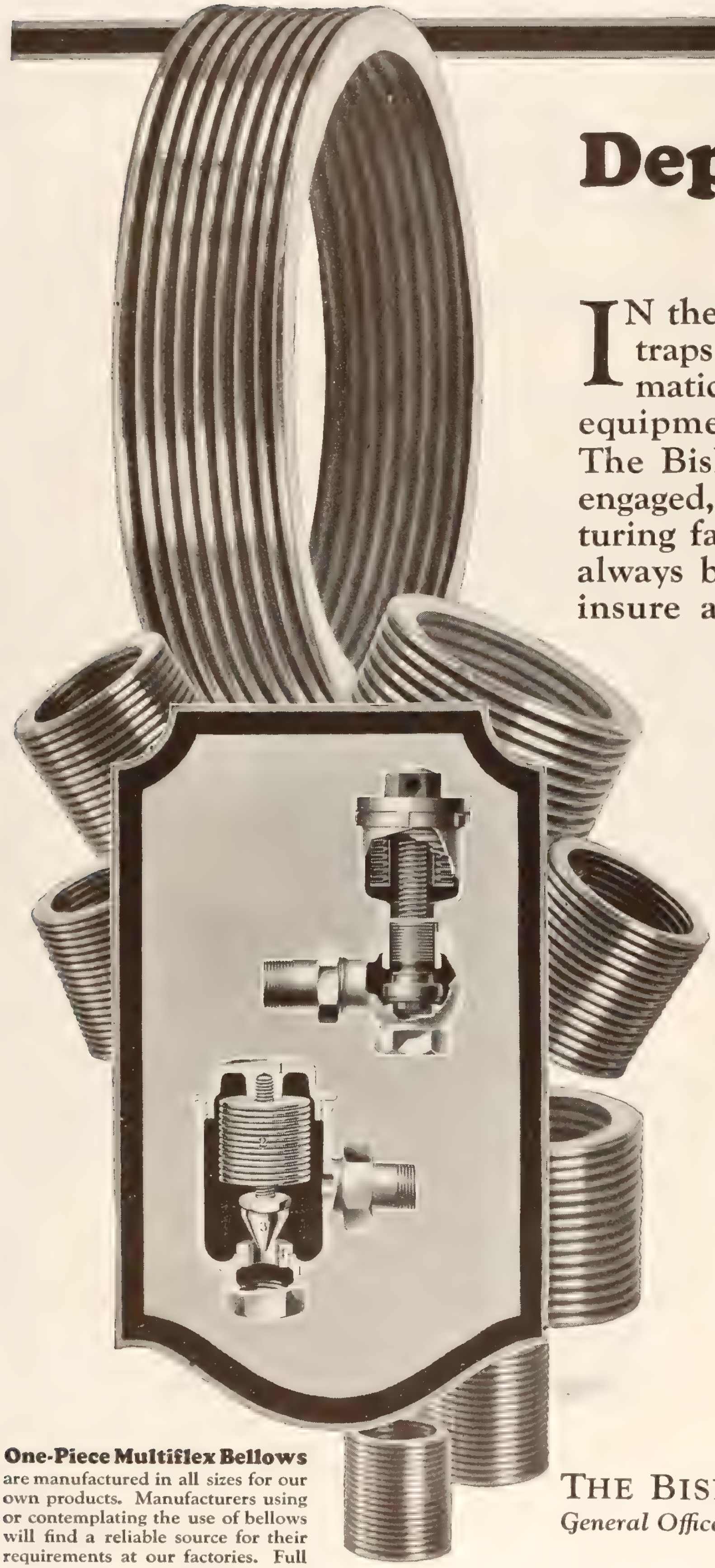
HEAT



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IN the manufacture of thermostatic traps or heating specialties, pneumatic valves or temperature control equipment, or other fields in which The Bishop & Babcock Mfg. Co. is engaged, the engineering and manufacturing facilities of the Company have always been adequately provided to insure a product of highest quality without dependence on outside sources for any part of the finished product.

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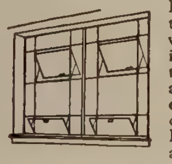
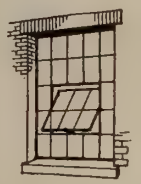
Projected Sash



First made by Lupton, this type of sash has met with constantly increasing popularity for factories, office buildings and schools. Easily operated ventilators stay open in any position. Made in Architectural and Industrial styles.

Pivoted Sash



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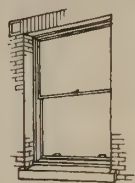

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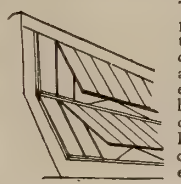

This sash forms a transparent, weather-protecting shelter over a continuous opening, and gives remarkable efficiency in the natural lighting and ventilation of industrial buildings. Long "runs" are readily controlled by Pond Operating Device.

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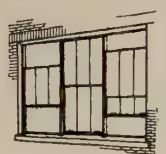
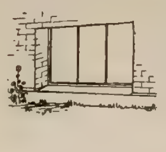


These windows make balanced ventilation automatic. When the lower sash is opened, the upper sash lowers an equal distance, thus providing an entrance for fresh air and an exit for exhausted air at the same time.

Basement



Lupton basement windows have transformed the lower part of the house to a bright, airy place. They give practically double the light of old fashioned wood windows, and never stick, rattle or warp. Made in four standard sizes.

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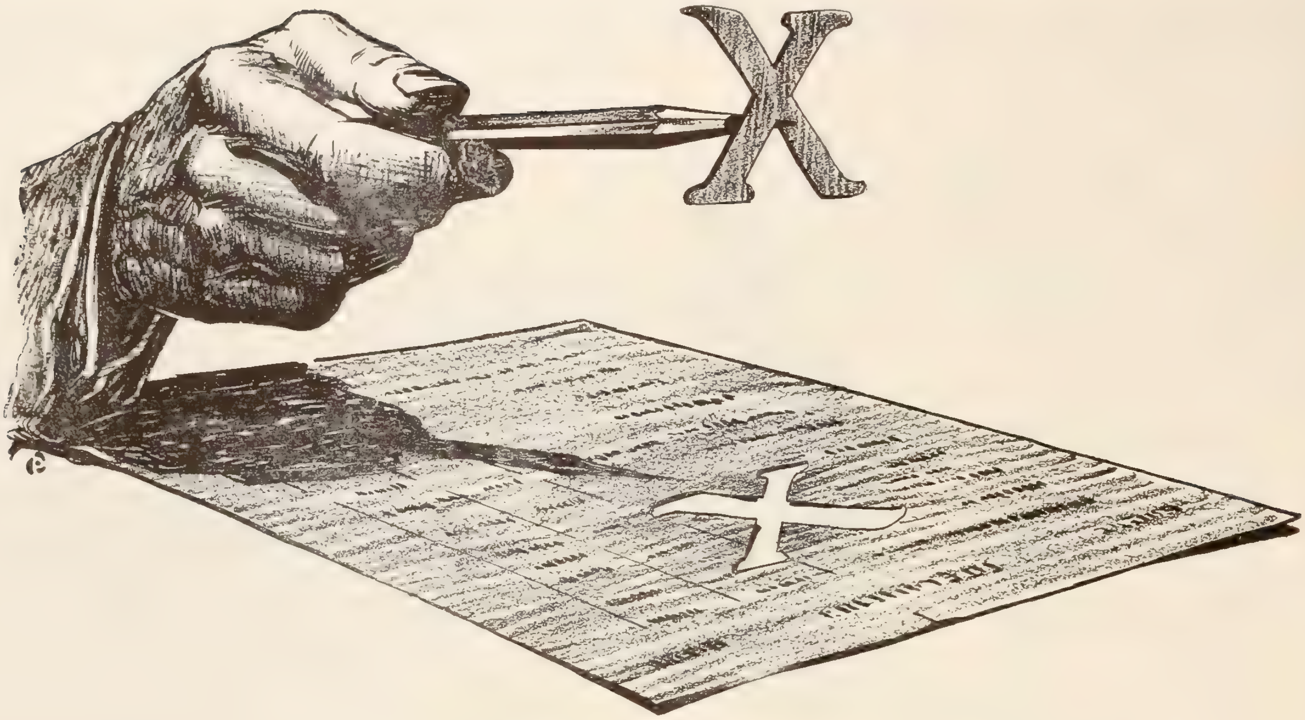

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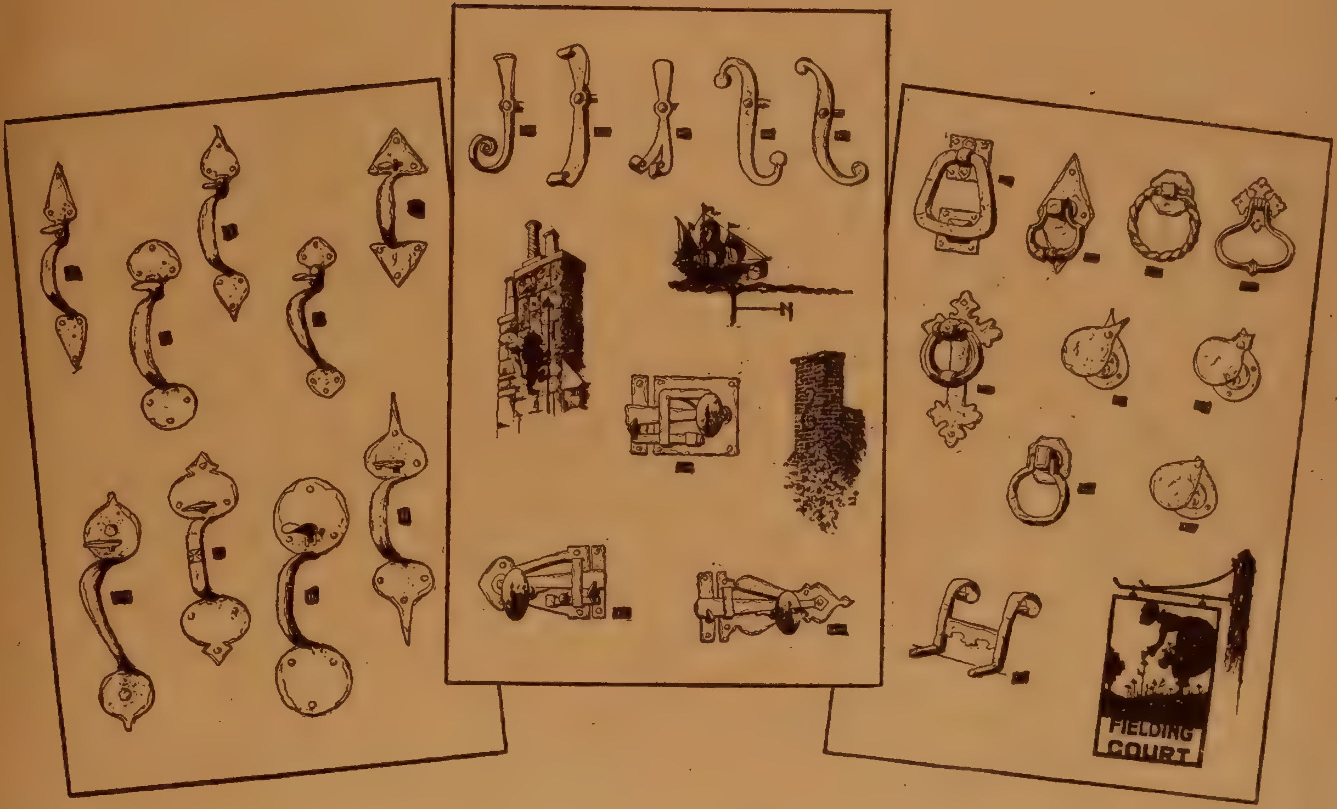

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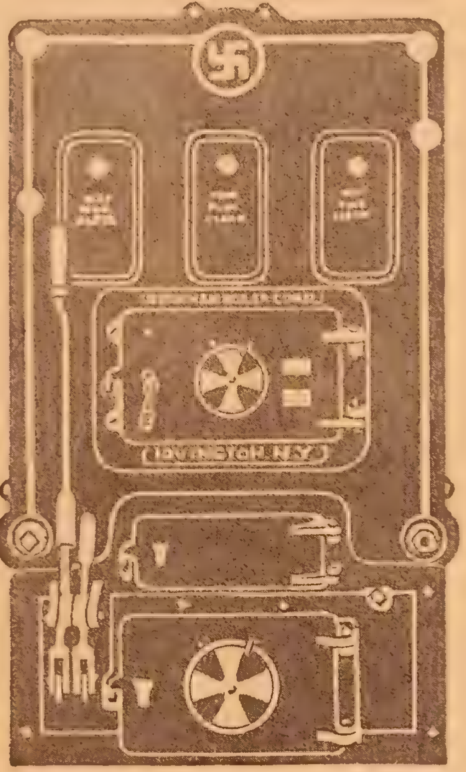

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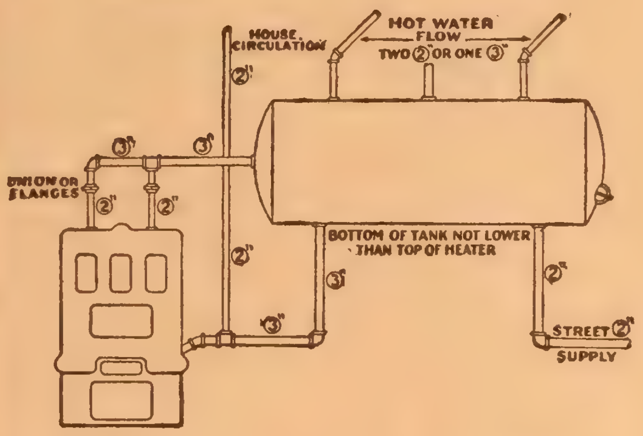

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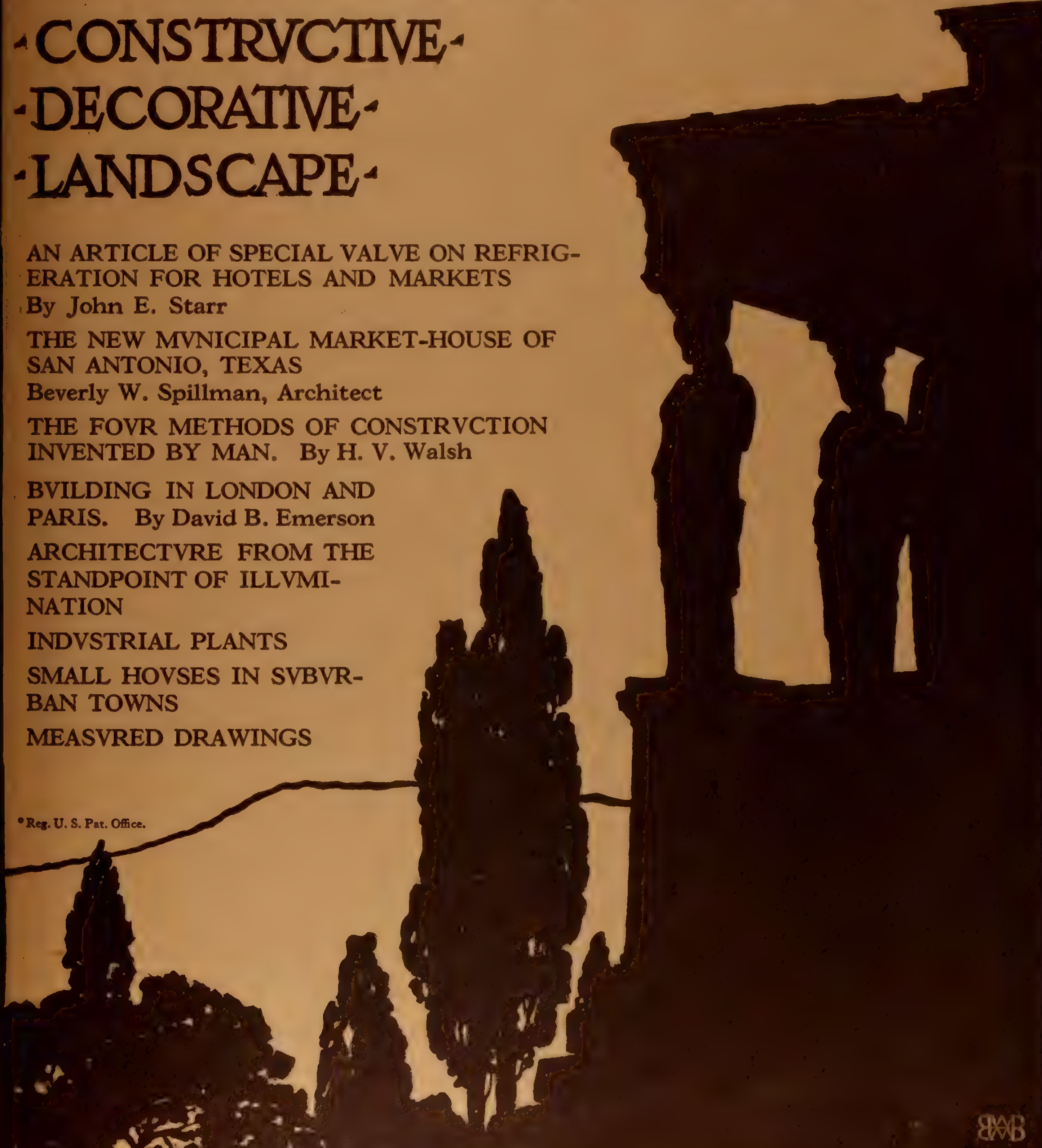

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H. AVRAY TIPPING

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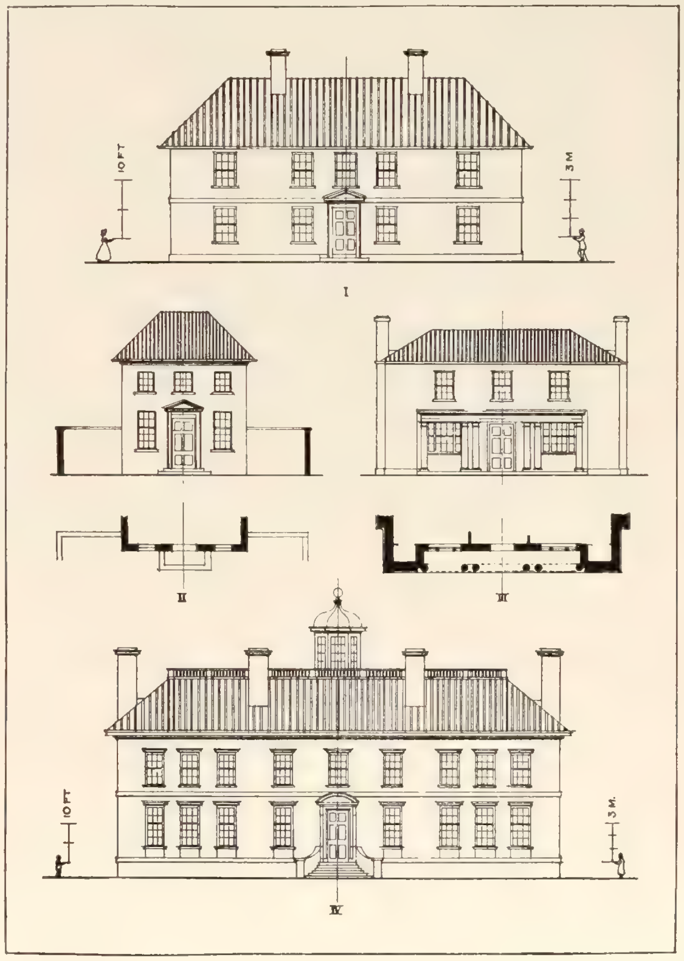

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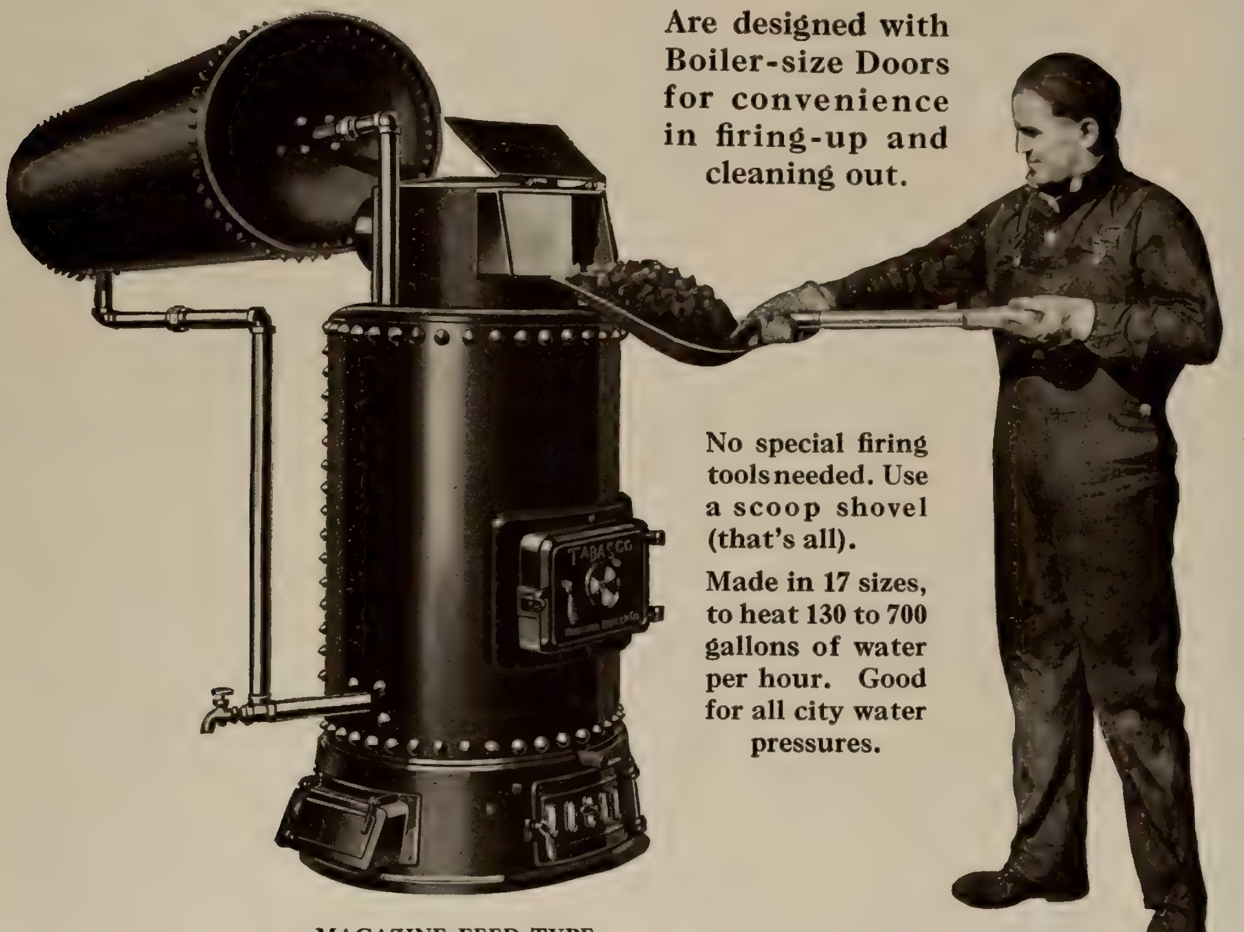

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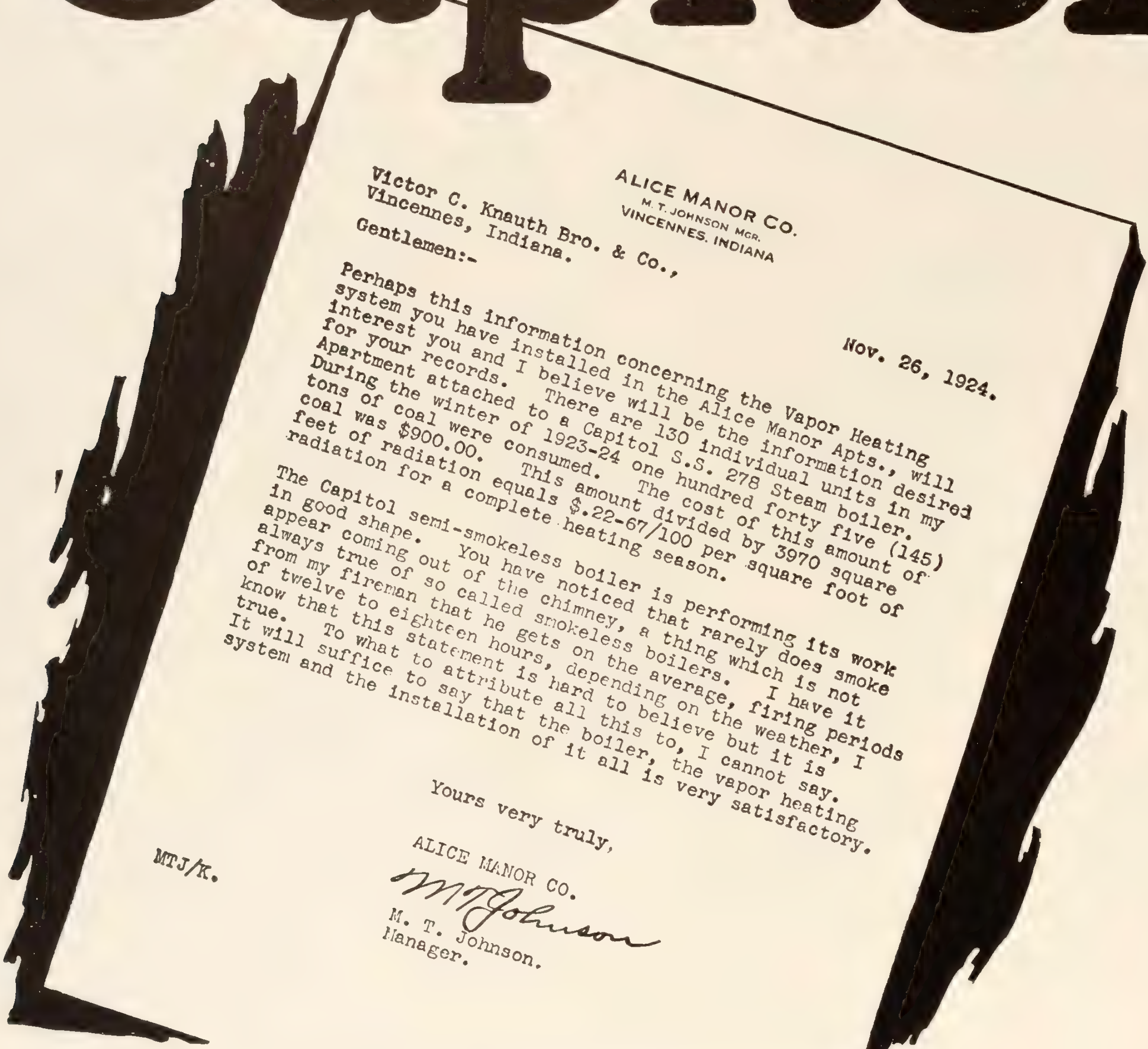

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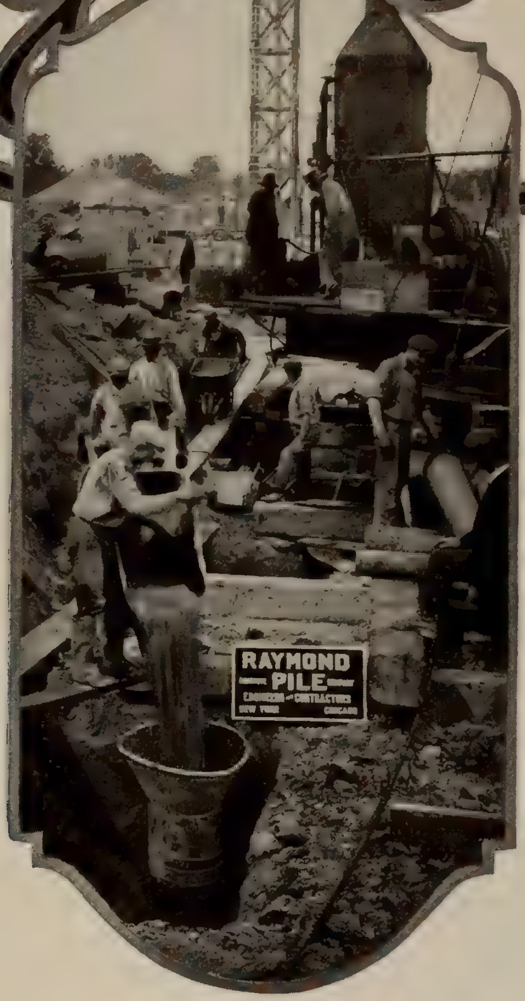

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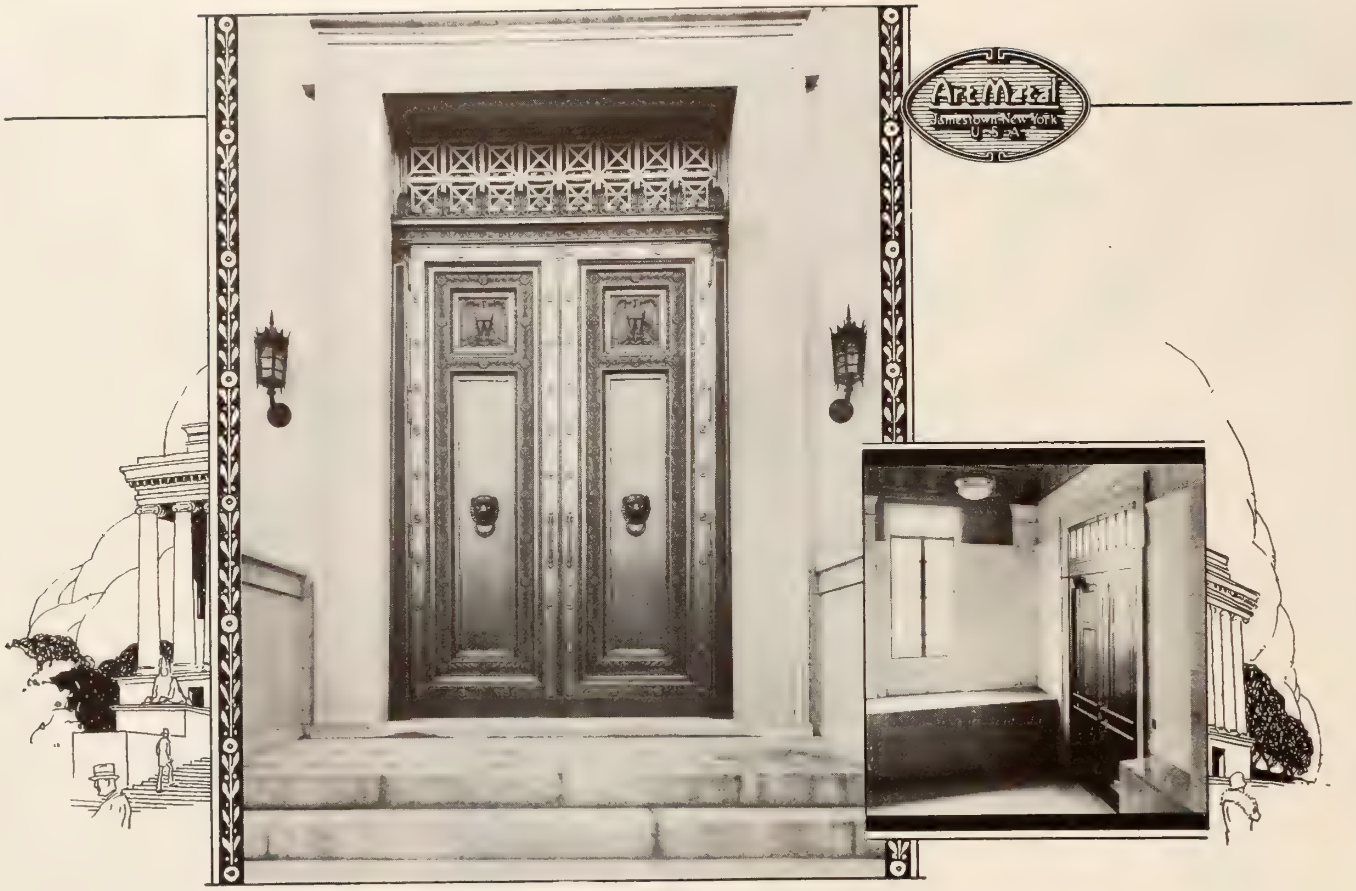

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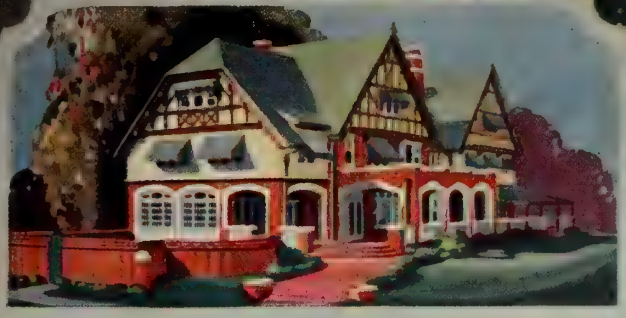

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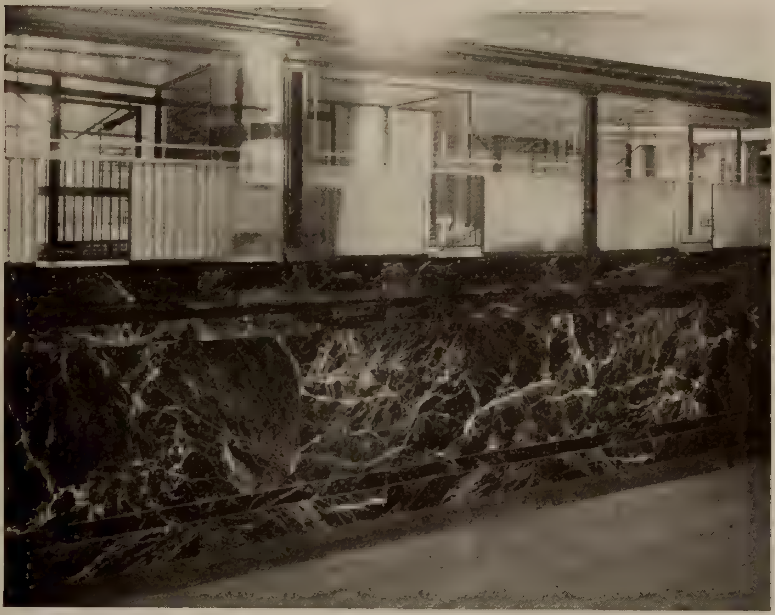
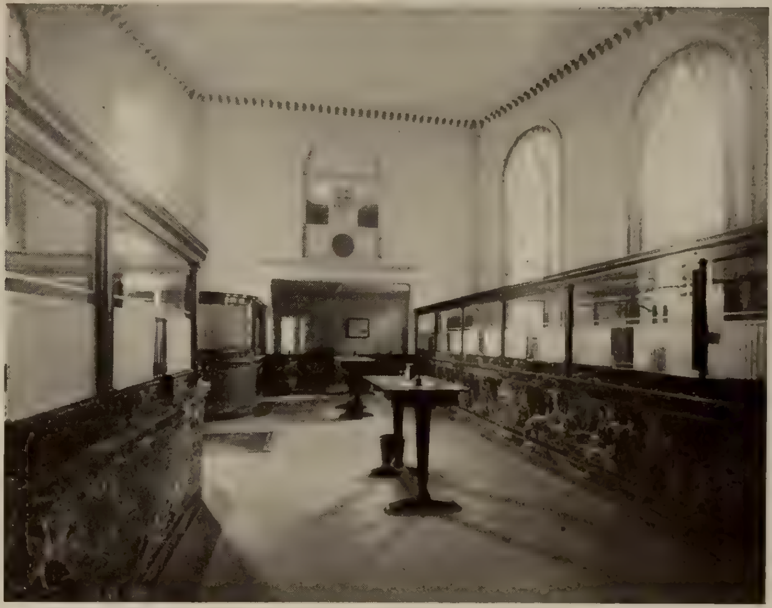


Views in the Westport Bank and Trust Company Building, Westport, Conn. Charles E. Cutler, Architect.

Hubbard said:

"The building must typify honesty, solidity, genuineness; also it must symbolize beauty."



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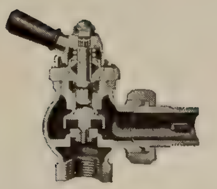

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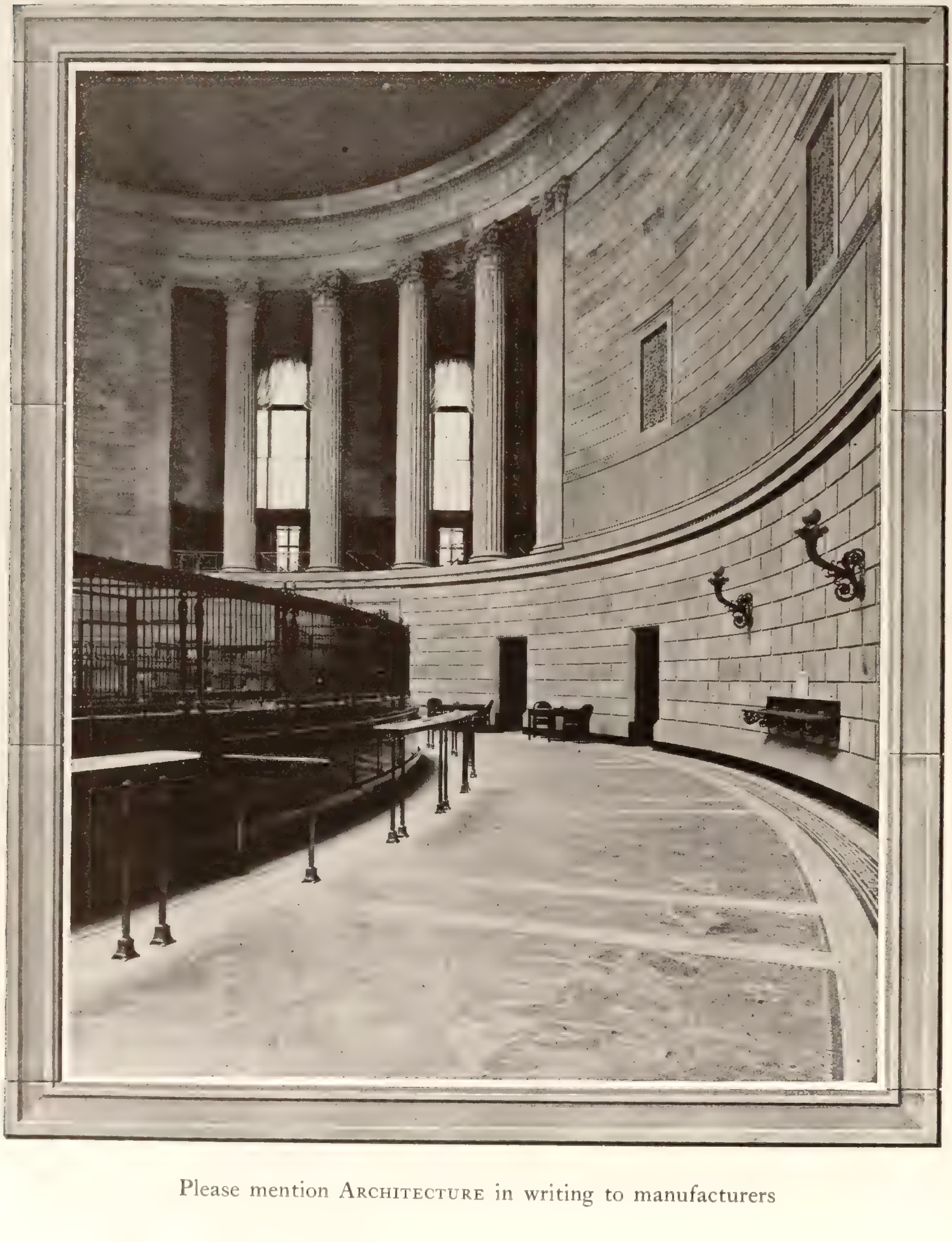

Interior view of main banking room
Greenwich Savings Bank
New York City

York and Sawyer
Architects

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The Fisk Building
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REGISTERED U. S. PATENT OFFICE

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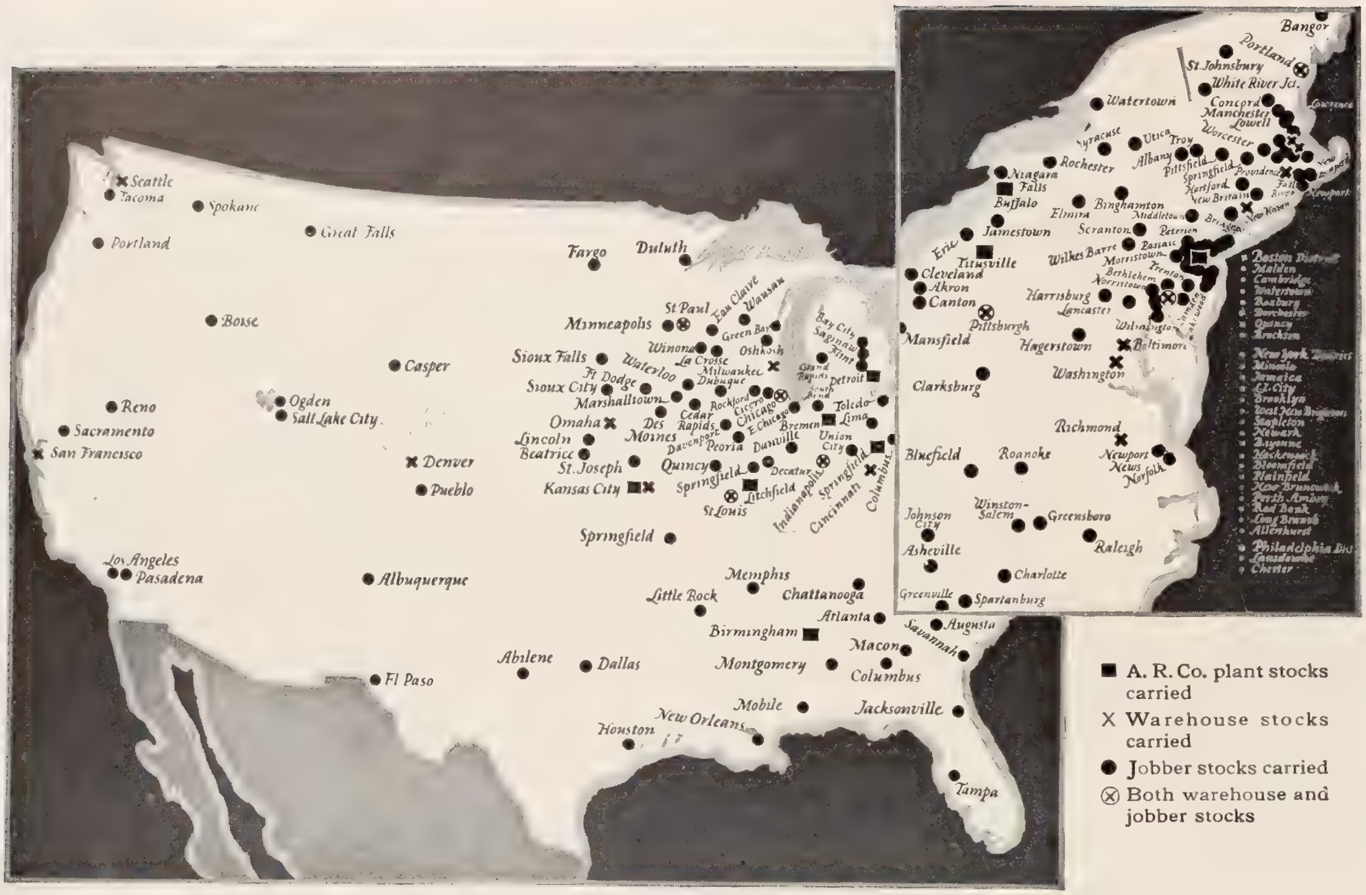
The "Hartford-Saxony" rug illustrated below is Pattern 1702, Color 1.



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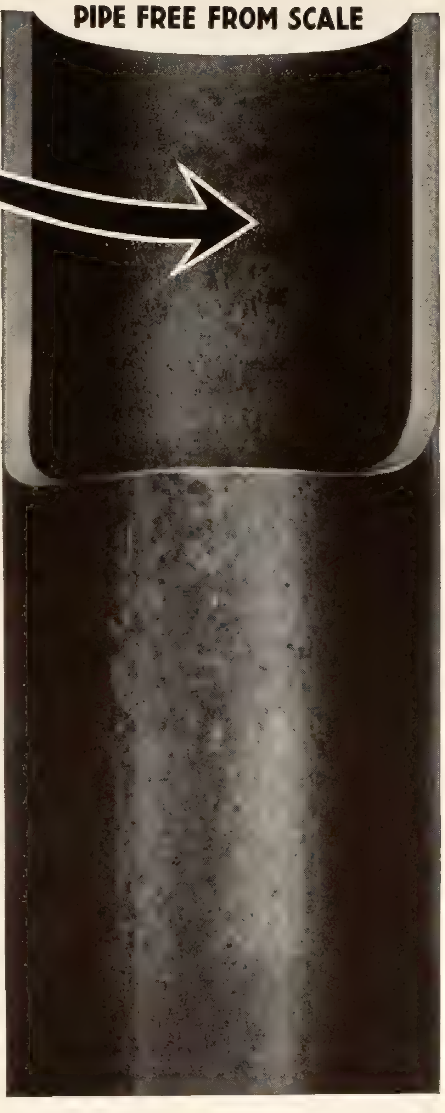

"NATIONAL" SCALE FREE Pipe, showing the clean, smooth surfaces of this modern product.

"NATIONAL" Pipe, butt-weld sizes $\frac{1}{2}$ to 3-inch, is made by the SCALE FREE Process, which removes the scale and leaves a clean, smooth surface. This process was invented and developed by National Tube Company — therefore, only "NATIONAL" Pipe is made Scale Free. For details of this process and its advantages, write for a copy of "NATIONAL" Bulletin No. 7.

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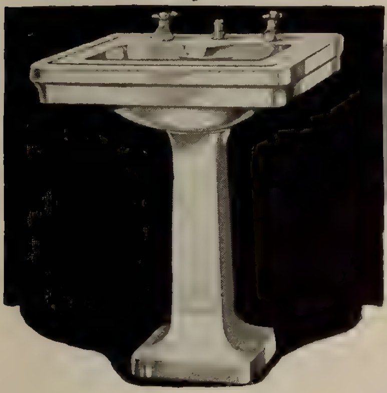
Common writing ink will stain some lavatory-ware so that even scouring will not remove the stain until the surface of the ware is worn down to the depth of the discoloration. In this test a Maddock Vitreous China Lavatory was filled with ink and left overnight. Next day the ink was drained off and the bowl wiped out with a damp cloth, when the ware reappeared as spotlessly and purely white as before.

The Madbury K-2000



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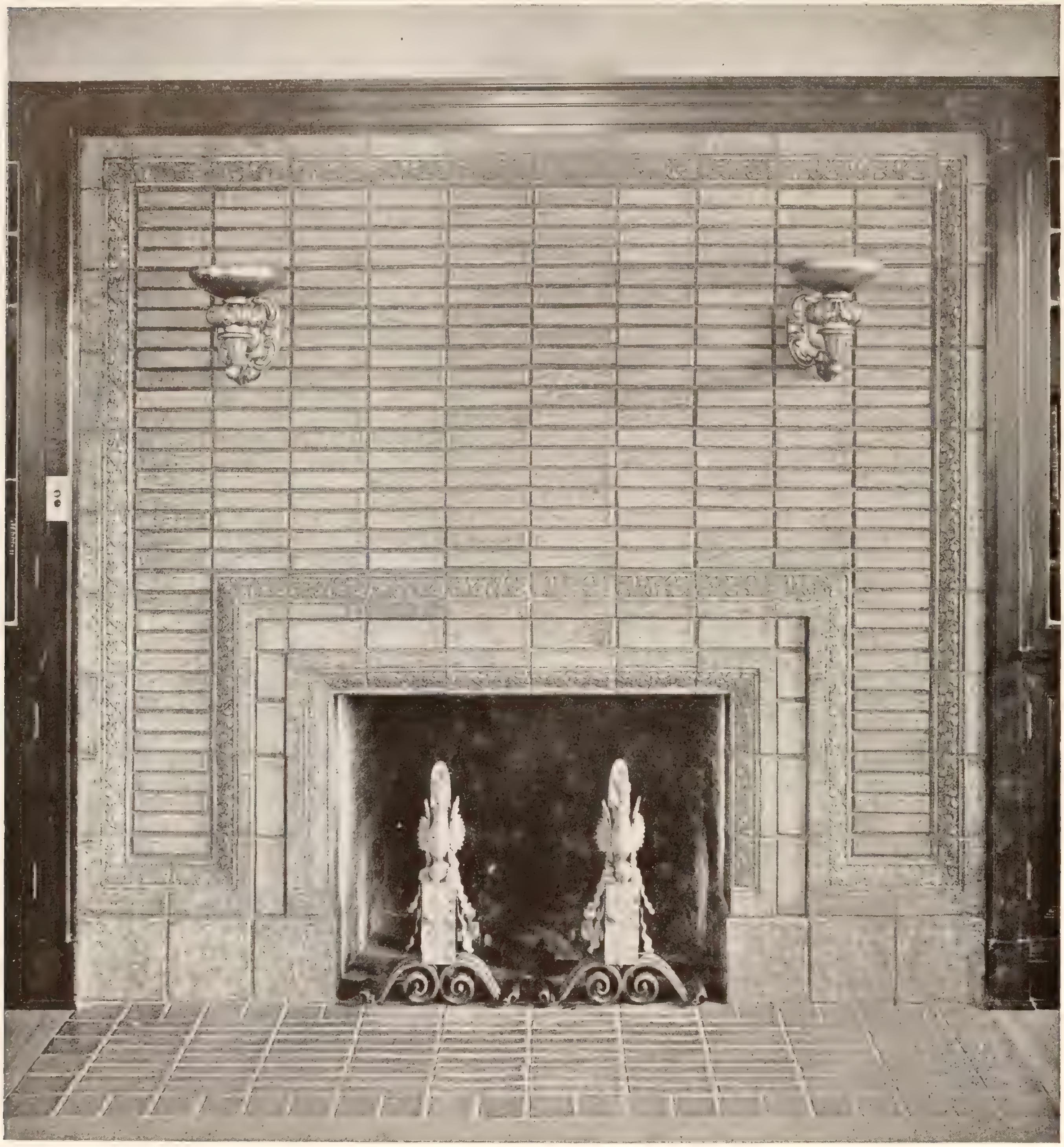

A mantel in a Seattle home showing a most interesting adaptation of stock materials

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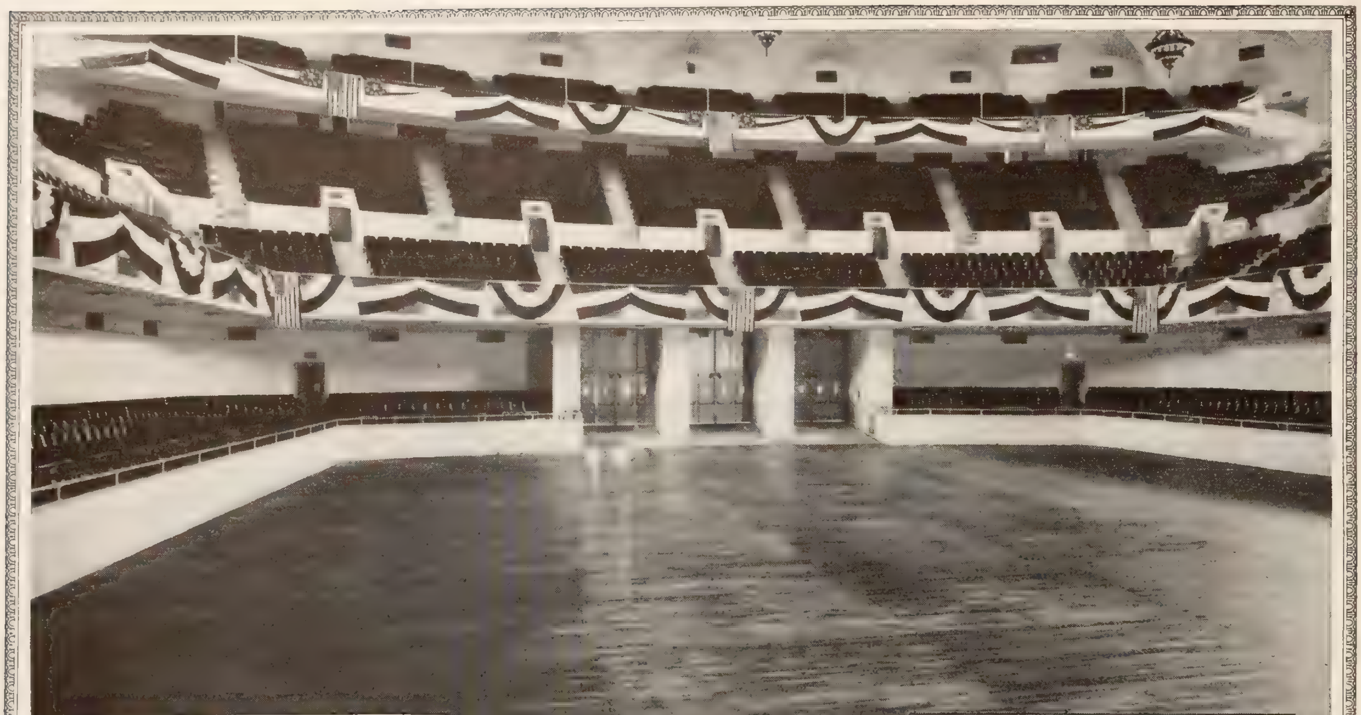

Charles O. Pfeil and George Awsumb, Architects

Beech
Flooring in the new Memphis Auditorium

A beautiful expanse of Bruce oak flooring

Installed on frames, in sections, readily removed when desired

THE main hall of this spacious Municipal Auditorium, built for the citizens of Memphis, Tenn., seats approximately 13,000 and is the second largest auditorium in the country. It is floored with 16,000 feet of $13/16''$ x $2\frac{1}{4}''$ clear Bruce Beech flooring, laid in removable sections to accommodate occasions for which a wooden floor would not be desirable. The sections are 16 ft. wide, and may be easily discerned in the photograph above.

Bruce Oak Flooring Also

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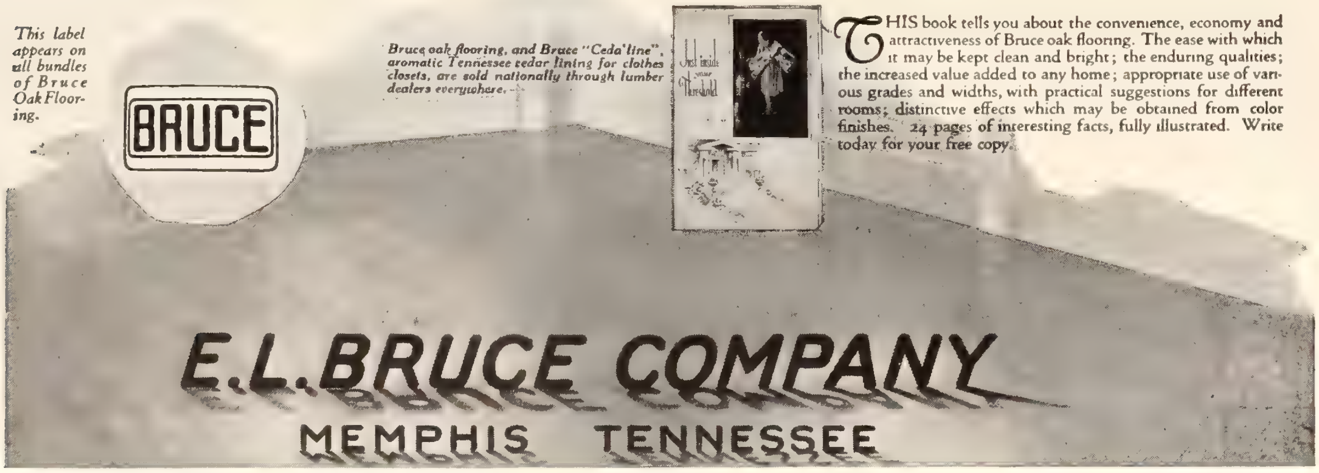
The Bruce organization is ready at any time to be of service to architects in solving a specific floor problem which may arise in their practice. Please be free to call upon us, without obligation. See our catalog in Sweet's for specifications, and write us for authorative and valuable technical literature.



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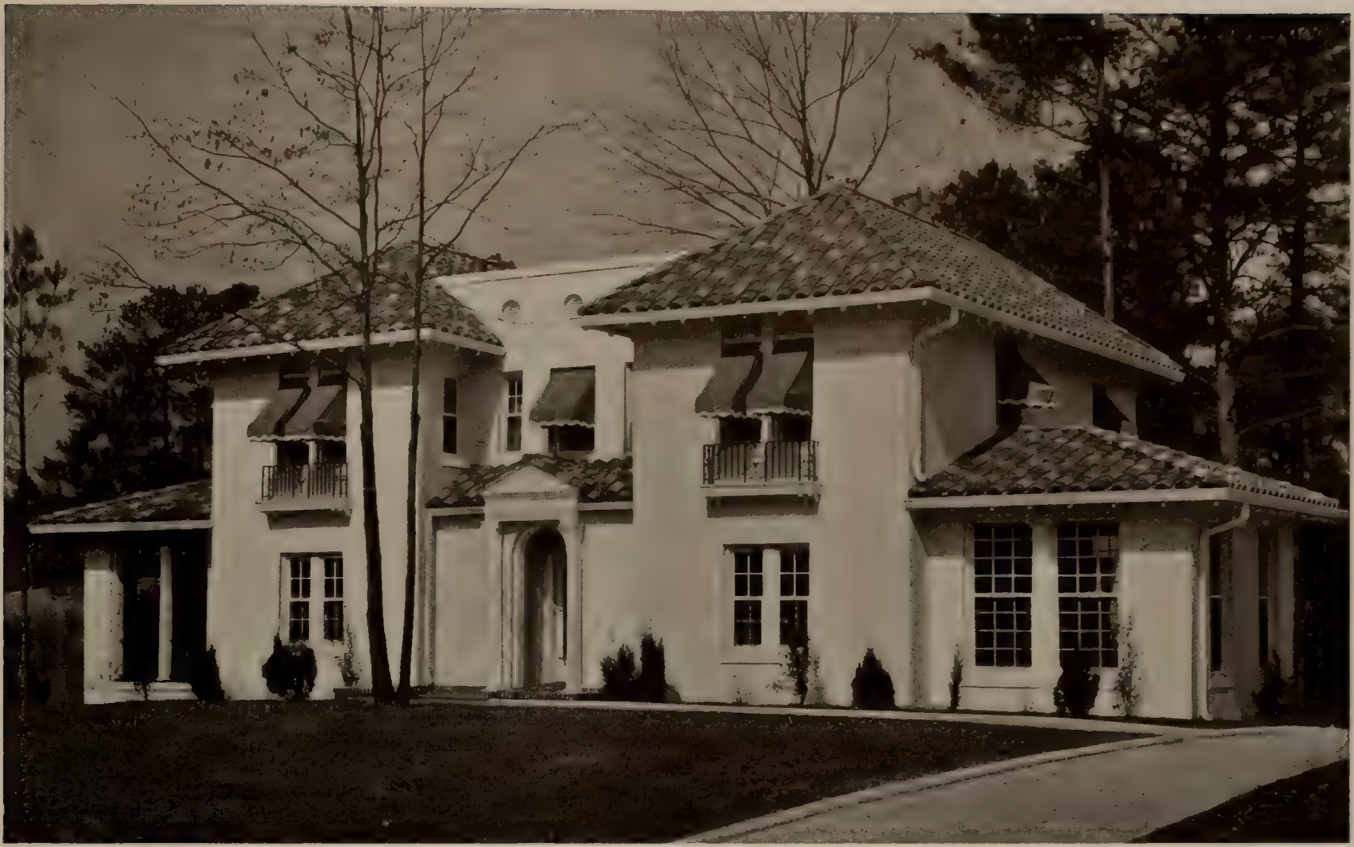

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And remember, where "time is money" use concrete.

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Kernerator-equipped 18-apartment building at 229 Lake Shore Drive, Chicago. Architects, Eckland, Fugard and Knapp; owners, "229 Lake Shore Drive, Inc."

Thoughtfulness That Pays

COMPETITION for tenants is daily becoming a more important factor in planning apartments. For many architects and owners, the Kernerator is a great aid in meeting this situation. Architects Fugard and Knapp are convinced of this—as a matter of fact have been specifying the Kernerator for years. The above admirably-planned apartment at 229 Lake Shore Drive is one of their latest Kernerator-equipped projects.

The Kernerator not only makes instant disposal of *all* waste, refuse and garbage the easiest task in the kitchen, but it saves money by—

> eliminating cost of garbage cans and their replacement—reducing janitor service requirements—minimizing possibility of tenant-janitor disputes sure to grow out of garbage collection—enhancing the cleanliness and attractiveness of the premises—reducing greatly the fire hazard.

Costs Nothing to Operate—No Fuel Required

As shown, the Kernerator consists of a brick combustion chamber at the base of the chimney, with hopper doors located in or near the kitchen on floors above. *All* waste—garbage, sweepings, tin cans, glass, crockery, papers, magazines, and the like—dropped through the handy hopper doors, fall to the combustion chamber. An occasional lighting of the air-dried waste burns everything but metallic objects and the like, which are flame-sterilized for easy removal with the ashes.

Full details appear on pages 2536-37 Sweet's (1924). For additional data, write

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KERNERATOR
Built-in-the-Chimney
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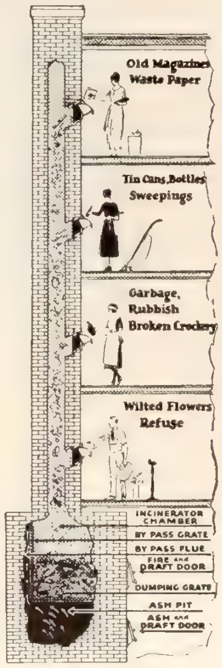

The soundness of the Kernerator principle and application, proved by thousands of installations throughout the country, is well illustrated above. Note: the Kernerator must be *built-in*—it can rarely be installed later without prohibitive expense.

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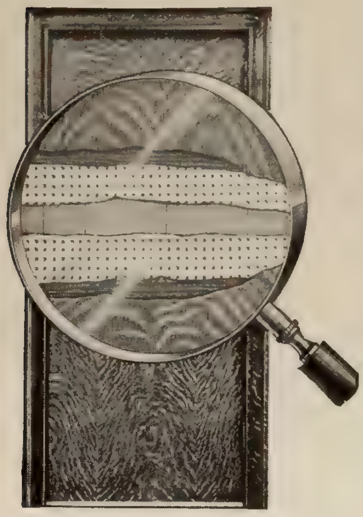

This shows Pyrono construction magnified, the asbestos sheathing indented into the core and the cross-banded surface veneers applied over it

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NOVEMBER 1925

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An Anaconda Installation

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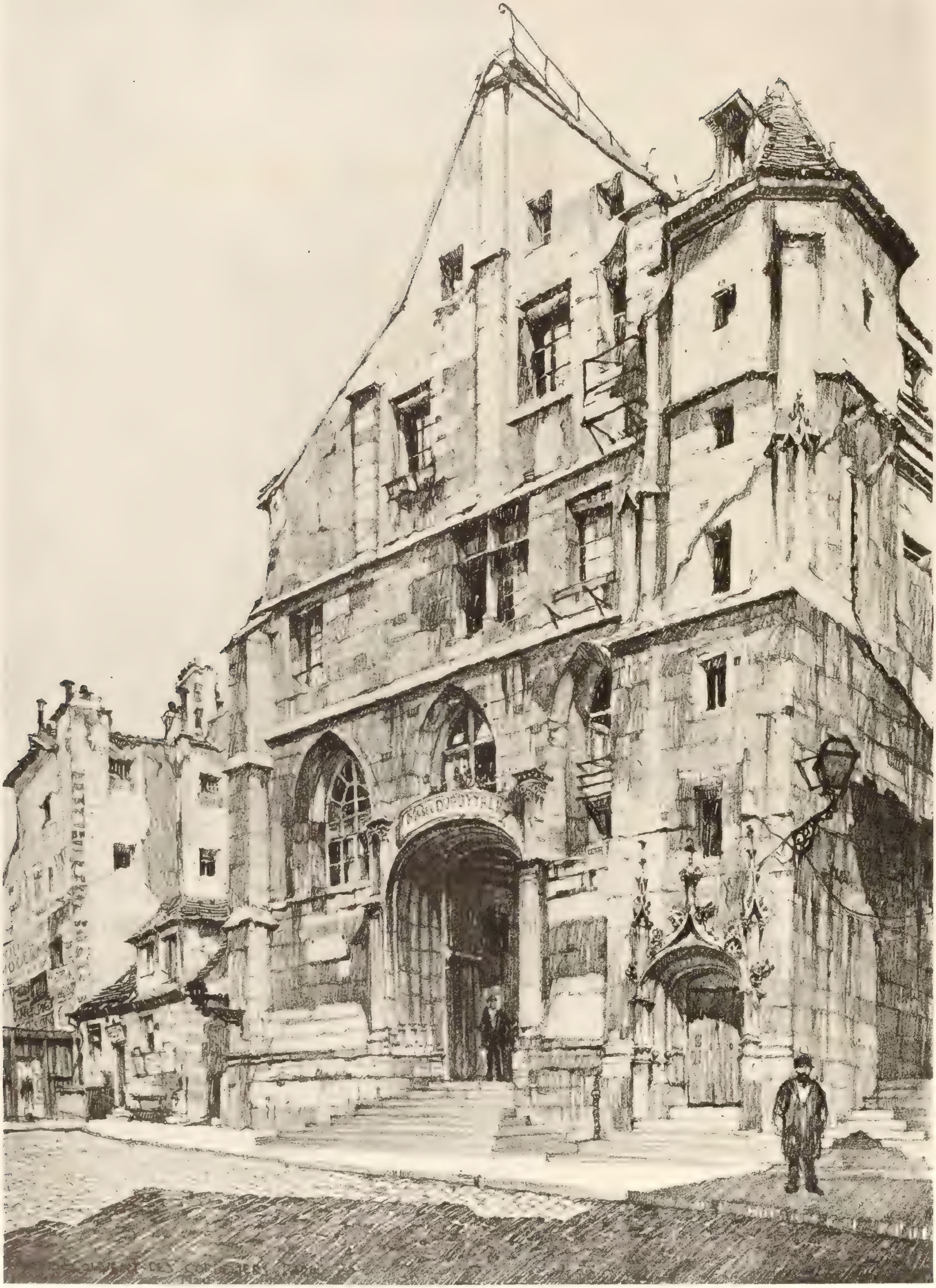

ANCIEN CONVENT DES CORDELIERS, PARIS. From the lithograph by Samuel Chamberlain.

• Reg. U. S. Pat. Office
ARCHITECTVRE *
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THE PROFESSIONAL ARCHITECTVRAL MONTHLY
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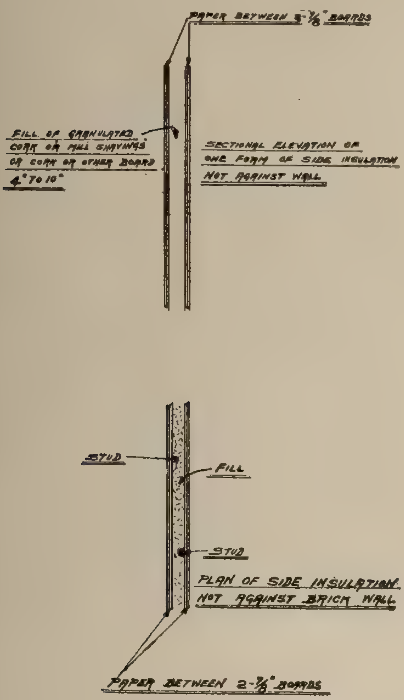
Refrigeration for Hotels and Markets

By John E. Starr

TAKING UP HEAT is now regarded as a matter of commensurate importance with *giving out heat* and a refrigerating plant is entitled to as careful consideration in an architect's plans as the heating plant.


PAPER BETWEEN 2-7/8" BOARDS
FILL OF GRANULATED CORK OR MILL SHAVINGS OR CORK OR OTHER BOARD 4" TO 10"
SECTIONAL ELEVATION OF ONE FORM OF SIDE INSULATION NOT AGAINST WALL
STUD
FILL
STUD
PLAN OF SIDE INSULATION NOT AGAINST BRICK WALL
PAPER BETWEEN 2-7/8" BOARDS

Side wall of a built-in refrigerator.

Especially important is this consideration in hotels and market-houses, and refrigerating methods on a small scale play a prominent part in the domestic economy of the household.

For small installations the unit method of refrigerating by a machine adapted for the amount of heat to be removed is gradually gaining ground, as is evidenced by the appearance of advertisements of appliances in the daily papers.

In hotels and markets, where the simple refrigerating operation can usually be under the eye and control of the engine-man in general charge, it is usual to use one or more machines placed suitably, usually in the general engine-room where heat taken from perhaps a multiplicity of refrigerators, large and small, is conveyed to the machine by brine circulating in flow-and-return mains, which mains are connected in multiple with coils placed in the boxes in space that would otherwise be occupied by ice, the only difference being that the coils in the box being colder on their surface than ice, and presenting a larger surface, do not take up nearly as much room. Hence a box containing a certain amount of cubic space inside of its insulating walls can devote a much larger percentage to the storage of goods.

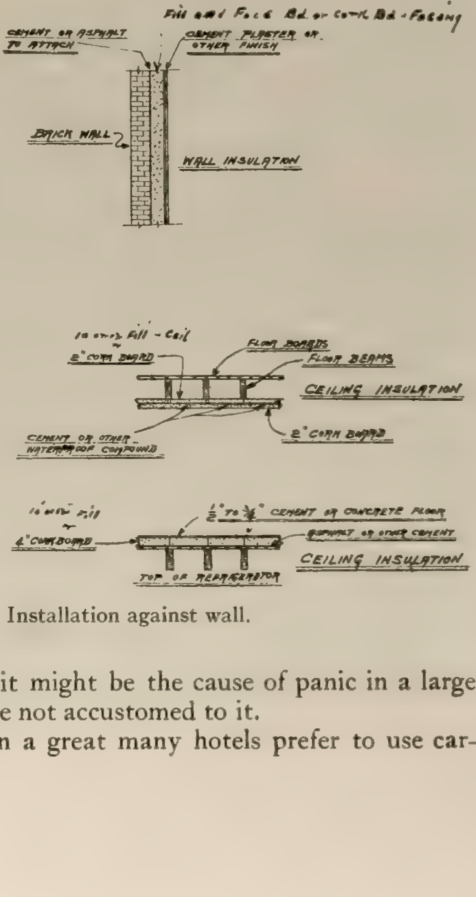
Ice might use about one-third of the cubic contents—while the coils might use less than one-sixth.

Refrigeration is produced by lowering the pressure of a liquid and hence lowering its boiling point anywhere between below zero and say 20 above zero Fahr. The action of the pump, so lowering the pressure on the suction at the same time, increases its pressure on the discharge until the pressure is sufficient to condense it to a liquid at temperatures ordinarily given by water, when it is used over again with little or no loss. The power used is the power from any source, such as a steam-engine, but of late years mostly from an electric motor. In the latter case, the power comes ultimately from the electric central station and is paid for at so many cents per K. W. hour.

Much care must be used in selecting the machine. Reliable and experienced manufacturers only should be considered. There are many makes in the market mostly all working on the same principle, that of a pump generally of the two-cylinder type.

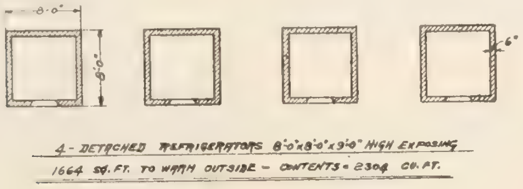
Care also must be taken in the selection of the refrigerant used, and for hotels and markets and places of large occupancy, it is often considered advisable to use a fluid that offers no objections in case of a possible leak and escape of gas. None of the liquids usually used are especially dangerous to life or destructive of property, but some are offensive and may be alarming to the public if a leak should occur.

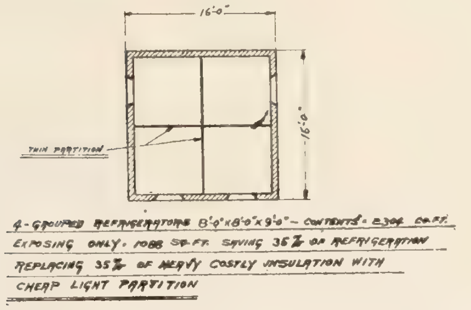
Ammonia is used by perhaps 85 per cent of all refrigerating machines in this country, as it happens to be a cheap fluid and gives great flexibility of temperatures convenient for refrigeration and is condensible at ordinary water temperatures at convenient and moderate pressures, but it has the disadvantage of possessing a pungent smell and is irritating to the mucous membrane. If it should escape it causes discomfort, though seldom actual danger, but it might be the cause of panic in a large assemblage of people not accustomed to it.



Installation against wall.

For this reason a great many hotels prefer to use carbonic acid gas (CO^2) which is odorless and seldom or never escapes by accident in large enough quantities to be harmful or even noticeable. It is also very cheap. The power cost of refrigeration depends more on work done on the fluid than on the kind of fluid, so it makes very little difference from the standpoint of refrigerating cost what fluid is used. Chloride of methyl and chloride of ethyl are if anything rather pleasing in odor and are not likely to cause discomfort if they should escape; in fact, with the safety devices prescribed by the American Society of Refrigerating Engineers or the safety code under the law of the City of New York, there is no danger from the use of any liquid permitted and very little occasion for discomfort should a leak occur.


8'-0"
8'-0"
6"
4 - DETACHED REFRIGERATORS 8'-0"x8'-0"x9'-0" HIGH EXPOSING
1664 SQ. FT. TO WARM OUTSIDE - CONTENTS = 2304 CU. FT.


16'-0"
16'-0"
THIN PARTITION
4 - GROUPED REFRIGERATORS 8'-0"x8'-0"x9'-0" - CONTENTS = 2304 CU. FT.
EXPOSING ONLY. 1088 SQ. FT. SAVING 35% OF REFRIGERATION
REPLACING 35% OF HEAVY COSTLY INSULATION WITH
CHEAP LIGHT PARTITION

Grouping of four boxes, saving 35 per cent refrigeration requirement for same cubic space.

Of course, the use of brine as a heat carrier can be avoided by sending the liquid used in the machine direct to the coils in the refrigerators and boiling there into a gas, returning the gas to the pump, but the use of brine as a heat carrier is perhaps a little better, as most anyone knows how to handle a brine valve, while it takes some experience to handle liquid used for refrigeration; so with brine the handling of the refrigerating fluid valve is all confined to one or two valves under the care of the engineer, and such opening and shutting of the valves as may occasionally be necessary at the several refrigerators can be attended to by any one having sense enough to open or shut a water-valve. To be sure, the mains and all connecting piping outside of the refrigerators must be covered just the same as that portion of steam-piping where it is not intended to give out heat should be covered. A good pipe covering costs more than the pipe, but a careful layout of mains will reduce the expense to a minimum. About 15 per cent of all the heat taken up comes through the insulation of the pipe mains; hence the necessity of laying out the piping plan so that the largest number of refrigerators can be reached by the shortest length of supply and return main.

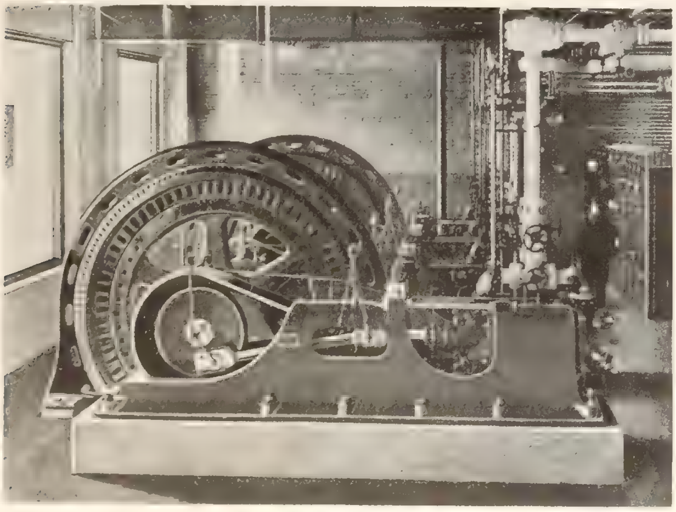
Particular attention should be paid to the possible grouping of the boxes. The amount of refrigeration required is greatly more in proportion to the square surface interposed between the warm outside and the cold inside, than to the cubic feet. Nearly 85 per cent of all the refrigeration required or heat taken up comes through the refrigerator, while only about 15 per cent may be ascribed to cooling the contents and to door openings; hence, wherever possible, boxes should be so grouped as to expose as small a surface as possible to the warm outside by placing boxes adjacent to each other or (if there be two or more floors) to place boxes on one floor over boxes on the other floors. This is generally possible in hotel work, but not often quite so easily accomplished in market installations, and yet boxes can at least be placed in much market work two and two adjoining to serve two stalls, while in hotel work it is often possible to put four or more boxes together, so as to cut out 25 per cent of the outside exposure, and sometimes better can be done. It is not always possible so to group the boxes as to give the best possible results as to total refrigeration of the entire cubical contents, but if the first principles of refrigeration are kept in mind, much of advantage can be done in this direction.

Separate boxes are usually sold in the market and provided by refrigerator builders who can supply boxes built to specification as to heat transmission per square foot, per unit of time per degree of temperature difference.

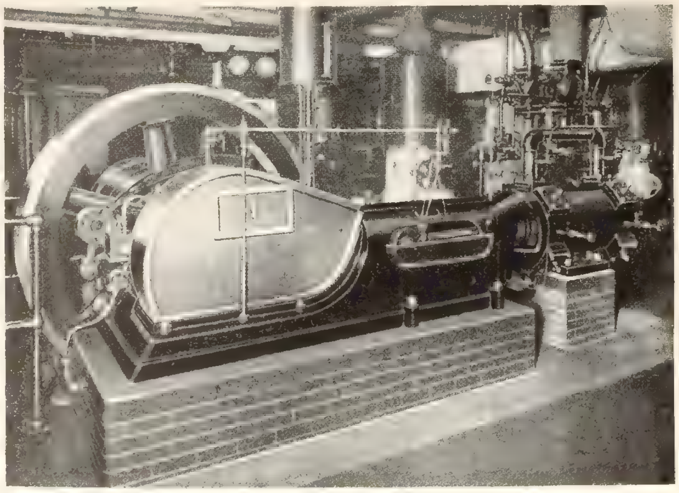
For small boxes on account of the desirability of a small percentage of space of insulation to cubic contents usually required, a transfer of about 2½ to 3 B.T.U. per square foot per day of 24 hours per degree (Fahr.) of difference in temperature inside and outside is tolerated in a good job.

In the usual run of manufactured refrigerators, the rate is greater than this.

In larger "built in" refrigerators the use of space for



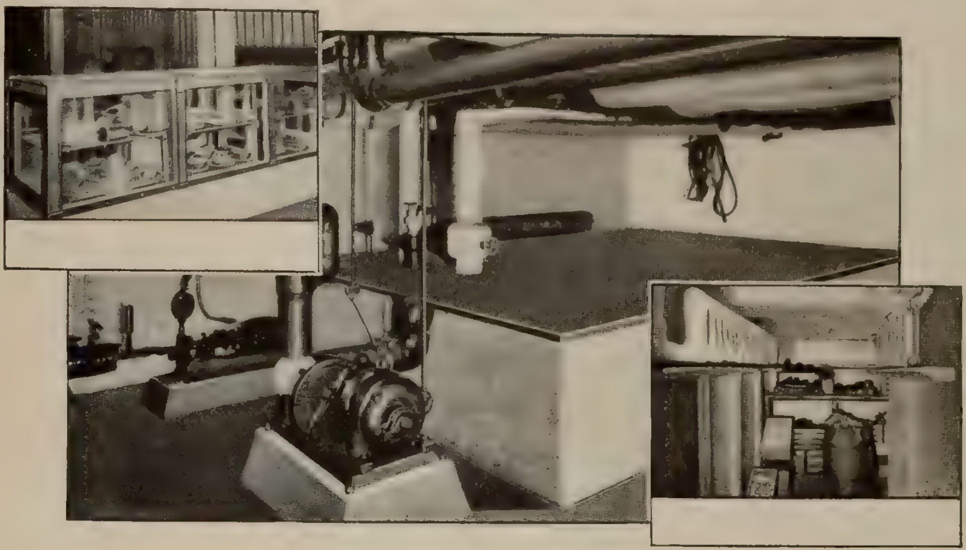
A refrigerating machine driven by electric motor.



A hotel or market refrigerating machine.

insulation is of so much smaller percentage of contents that a much better insulation is feasible, and with better heat insulation, the cost of apparatus and the cost of operation can be reduced. Not over 2 B.T.U. per square foot per day per degree of difference need be allowed, as it is commercially possible to put in up to 4 inches of insulating fill and any good insulating material should give less than 7 B.T.U. transmission per inch of thickness (or seven fourths) 1.75 B.T.U. per sq. ft. for 4 inches.

Many prefer cork board insulation which runs about 6 B.T.U. per inch of thickness and is not hygroscopic and so does not absorb much water from the air, which makes for long life and continued efficiency; but in a fairly dry exposure other material such as mill shavings, hair felt, "Lith," "Celotex" or other fibrous filling is often used and does about as well.



A machine in the engine-room of a market and some refrigerators operated by it.

Of late years it has come to be the custom to use an insulation in board shape instead of a loose fill between wooden boards. Such board insulation can be used without enclosing wooden boards at least on one side, as most of them will take a plaster or other finish and stand up well.

The insulating boards may be stuck to the wall by cement mortar or by hot asphalt, and the exposed interior covered with a coat of plaster finished smoothly, and perhaps an enamelled finish or any of the various finishing compounds on the market can be used.

Owing to the fact that the larger part of all the refrigeration required is due to heat coming through the insulation, it is always wise to see to it that the insulation be good down to the point where the interest and upkeep and amortization account on insulation balances refrigerating cost. There is no use of going any further.

A little figuring on this item is liable to show the possible saving of a lot of money both in first cost of apparatus and in cost of operation.

And beyond this lies the feeling of satisfaction of a client in seeing his operation not only economically but comfortably carried on.

The interior arrangement of the refrigerator must be carefully looked after. The piping must be so disposed as to give the best air circulation possible around the goods.

The ultimate object of refrigeration is of course the preservation of goods stored in the refrigerator.

Air carries the heat that is originally in the goods (a small item) and heat that would reach the goods to the cold piping and through the piping to the brine or other cooling agent, thence to the cooler of the machine and thence to the gutter or drain, where it will do no harm.

So it is well to see that the air reaches and surrounds the goods in its circulating course, and so picks up the best. Air approaching the piping will always be warmer generally by 15 or 18 degrees than air around the coldest part of refrigerator.

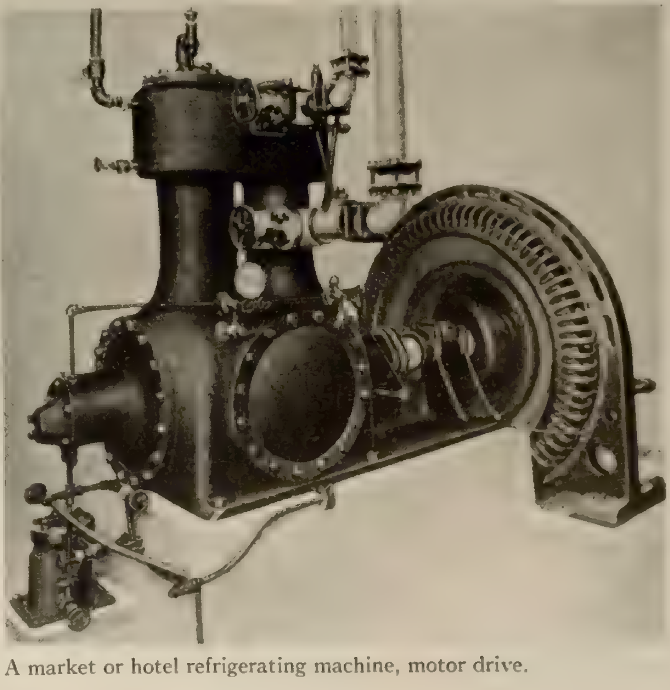
In an ice box, for instance, it is not unusual to see air leaving the ice at pretty near 32 and reaching pretty near 60 when the bulk of the space is from 45 to 55. So it should be with the piped refrigerator only that the temperatures may all be lower.

In some installations mere convection of the air is not relied on, but the air is moved forcibly by fans.

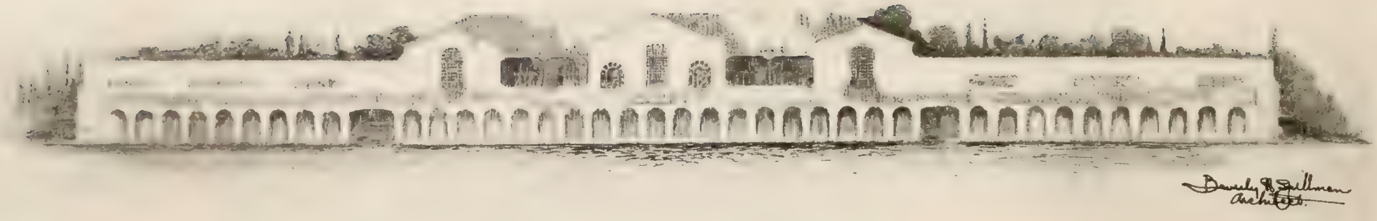
In the latter case a large amount of air is kept in circulation and the range of temperature between the air leaving the piping and approaching the piping may be much less.

This is only used where the entire contents of the box are desired to be kept at nearly the same temperature, such as in the case of eggs for long storage. It is not necessary in short-storage boxes, where a difference of 4 or 5 degrees in the main portion of the refrigerator cuts no figure, so long as the warmest temperature is low enough to hold the goods for their expected period.

Most goods in hotel and market work are comparatively rapidly turned over and the storage period amounts to only a few days, while in cold storage work goods are held often for months in store and a different and more even temperature scale must be used.



A market or hotel refrigerating machine, motor drive.

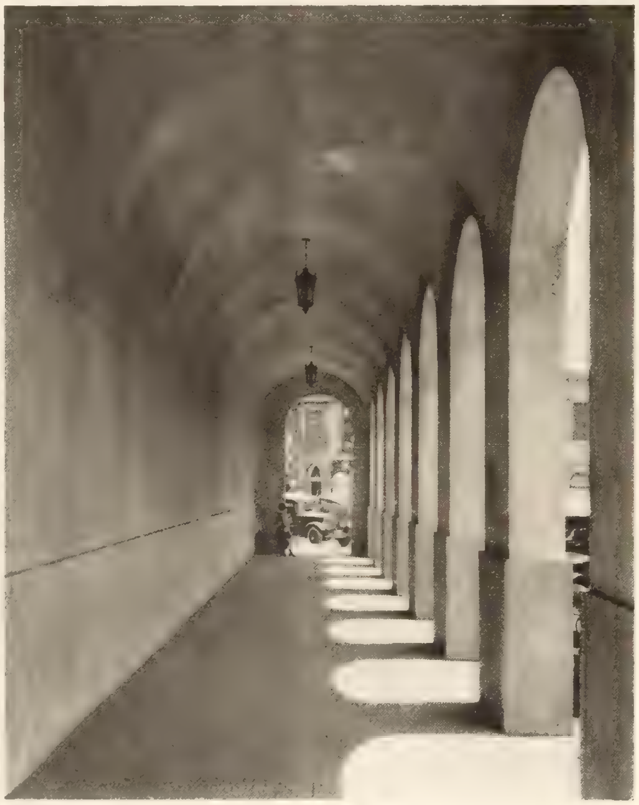


Design for entire structure.

The New Municipal Market-House of San Antonio, Texas

Beverly W. Spillman, Architect

DESIGNED in the Spanish type of architecture, which, with Italian, is being encouraged by local architects, the new market-house addition is presented. It is built on the side of the two parks on the east and west of the old market-house building.



Street arcade.

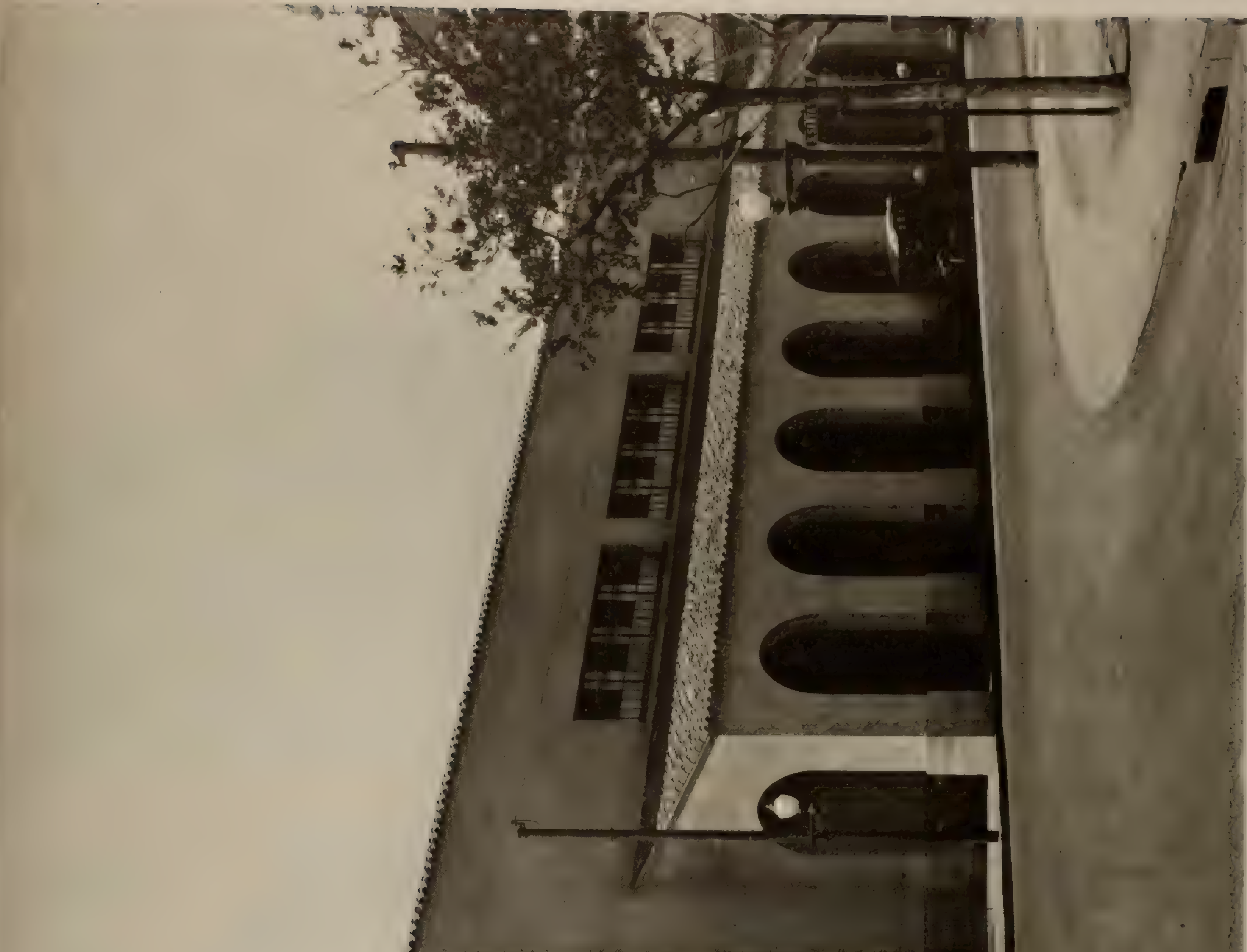
The building is of an ivory color with Latin clay tile roof, with all coping of walls capped with the same tile. The arcades are placed over sidewalks on the north and south elevations and run the entire length of 534 feet. The market is equipped with a modern refrigerating plant and each stall has a separate cold-storage space. All of the stalls are uniform in height, with lighting and fan systems carried out in the same manner.

On the main floor of the annex there are stalls of meat markets with cases refrigerated, vegetable stalls, groceries, and delicatessen space. On the mezzanine floor of this annex are ladies' rest rooms, ladies' toilets, men's toilets and locker space. There is dry-storage space for each stall and a space for music. An office is provided for the master, where he can overlook the entire annex without leaving his desk.

There is a refrigerating plant for the entire market, including coal-storage space for the annex and old building. There is space for cleaning and preparing vegetables, with the latest plumbing fixtures for this purpose. The incinerator is located near this cleaning-room, where all trash and débris around the market can be consumed. There are meat-market stalls, vegetable stalls, milk-products stalls, dressed-poultry and fish departments. The poultry and fish cleaning are separated by glass partitions from the sale space, thereby keeping these departments without odor. There is a mezzanine floor built in at each end of the building, affording dry-storage space, with office for market-master, and bandstand. The entire interior of the market is in a thoroughly sanitary and modern condition. The market has stalls of uniform height, with the latest lighting and ventilation systems, and is, wherever possible, finished in white tile.

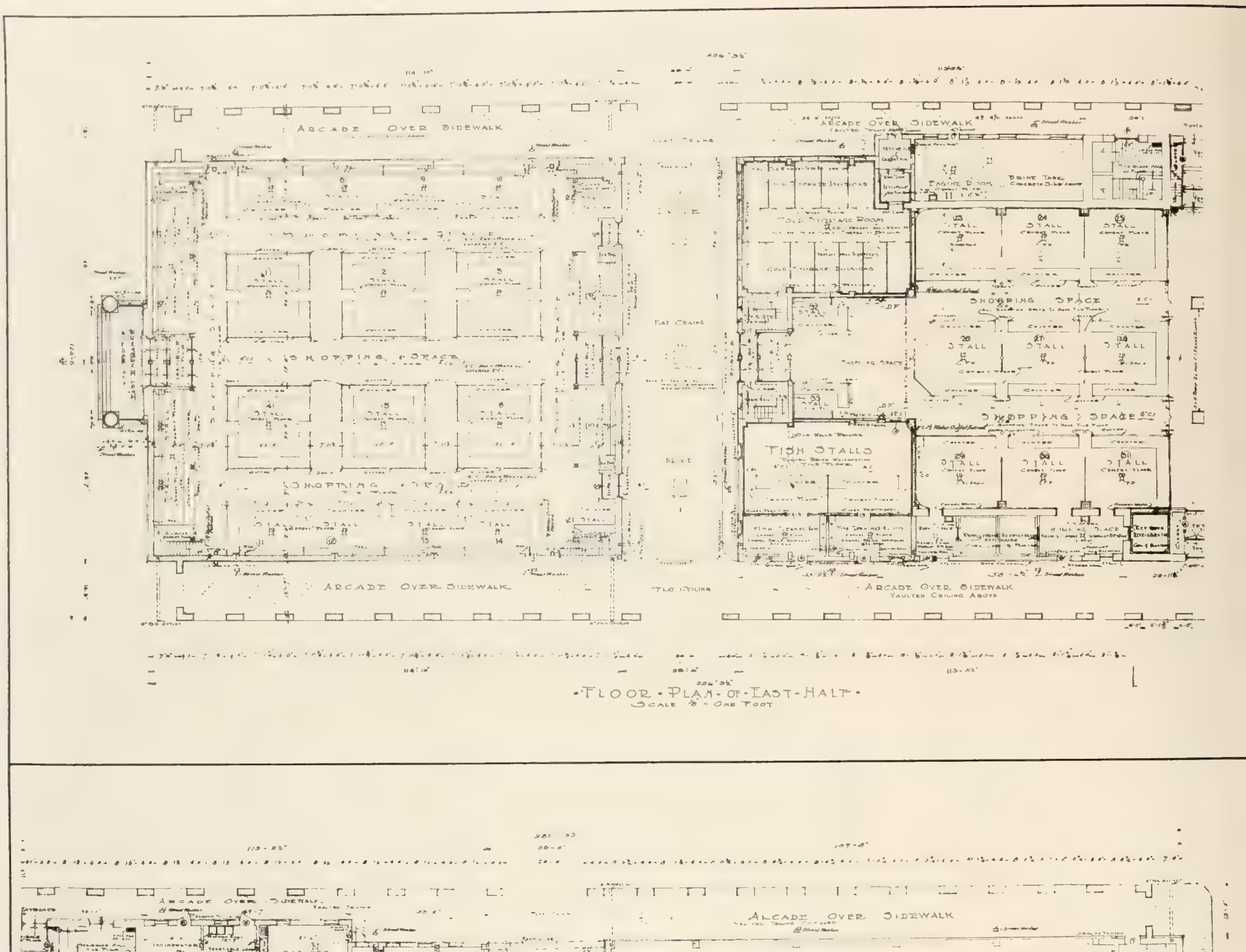
In the live-poultry department on the west there is space for public rest rooms, with offices for market-master over this department. The building will be 135 feet by 94 feet, covered and so arranged that it can be closed up in bad weather. There are two sallyports 28 feet in width, where customers can drive their cars in and enter market without being exposed to bad weather when shopping.

The auditorium floor is equipped for National Guardsmen room, with space for drilling, gun-room, locker-room, two officers' rooms, and toilets with showers. There is an assembly-room with anterooms leading off the main auditorium floor, with beautiful balconies, which may be entered from the main auditorium and from the stair hall. The new Municipal Market is modern in every respect, with the latest market ideas incorporated. The total dimensions of the building are 94 by 534 feet. Mr. Spillman hopes that San Antonio's municipal market will be a model for other growing cities.



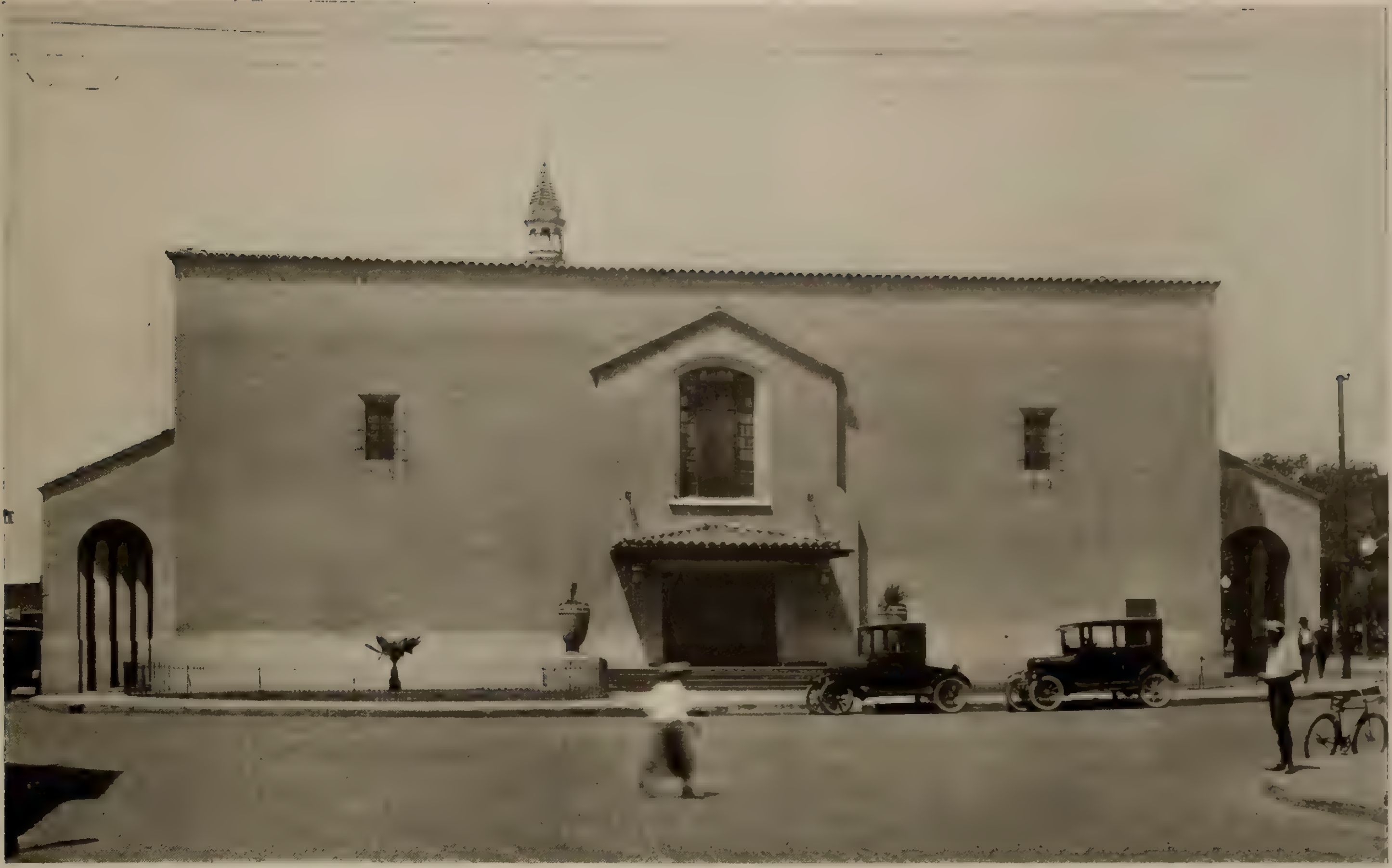
COMPLETED SECTION, NEW MUNICIPAL MARKET-HOUSE, SAN ANTONIO, TEXAS.

Beverly W. Spillman, Architect.

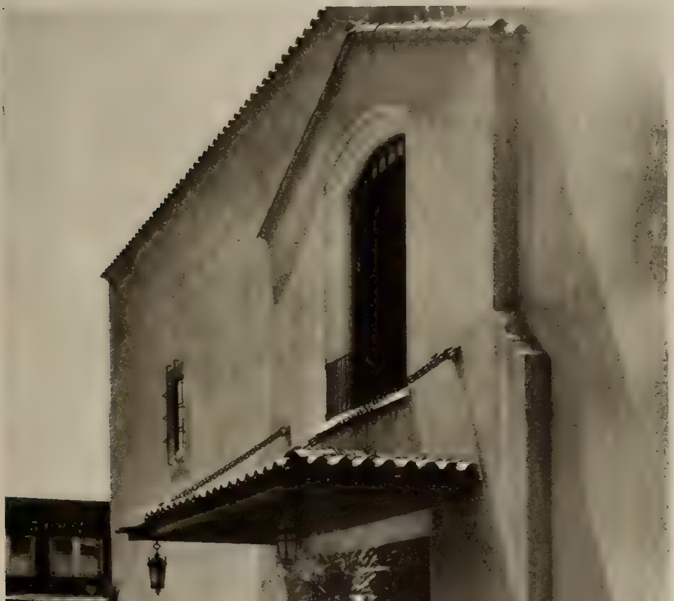


PLANS, NEW MUNICIPAL MARKET-HOUSE, SAN ANTONIO, TEXAS.

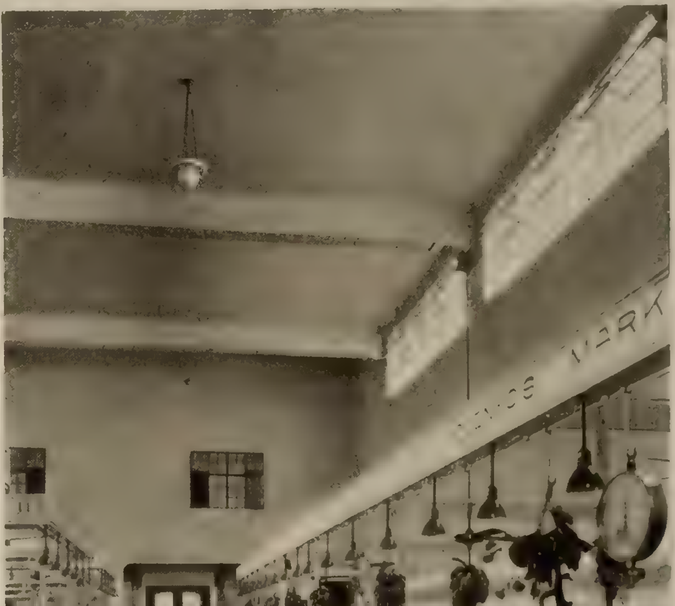
Beverly W. Spillman, Architect.



FAÇADE.

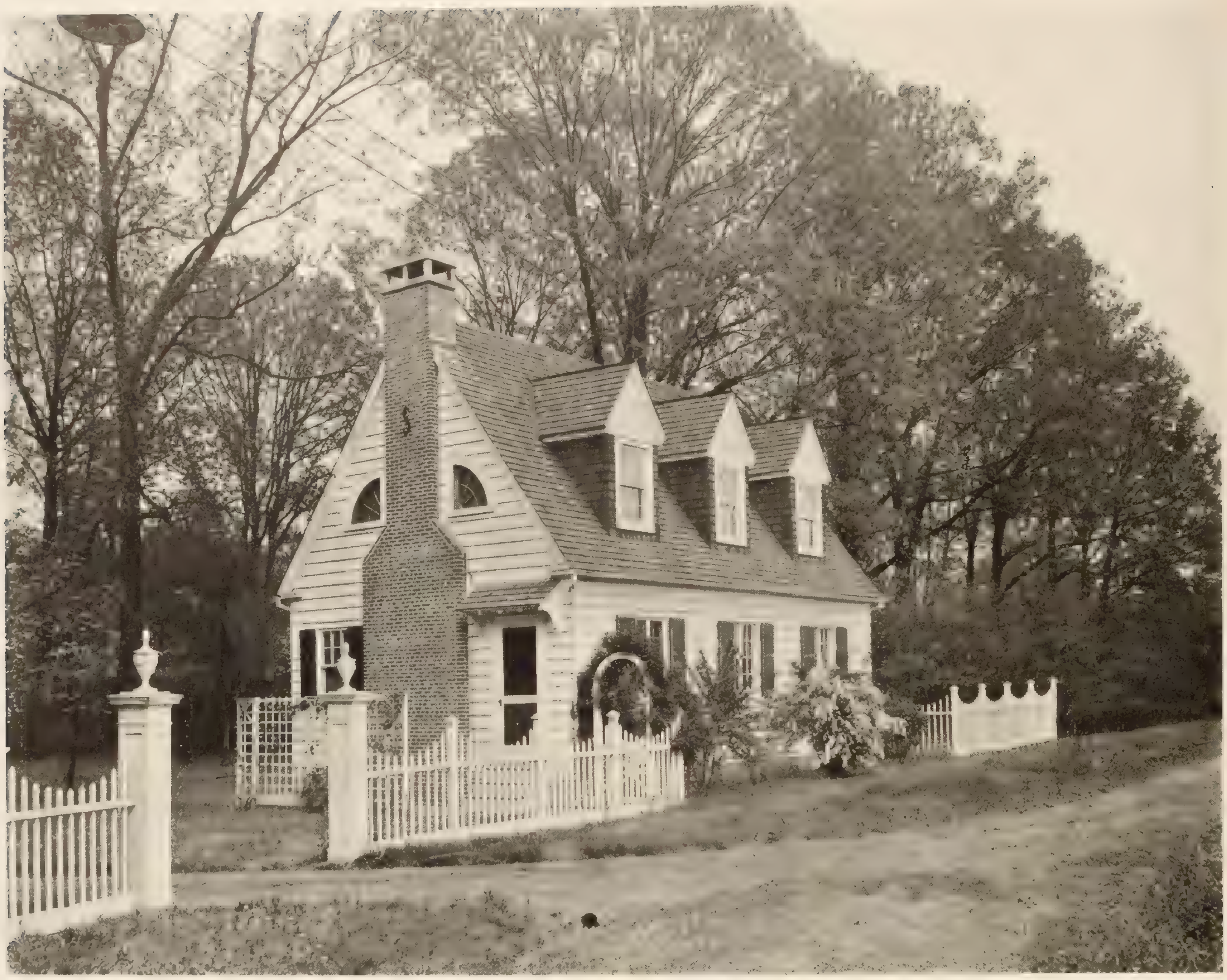


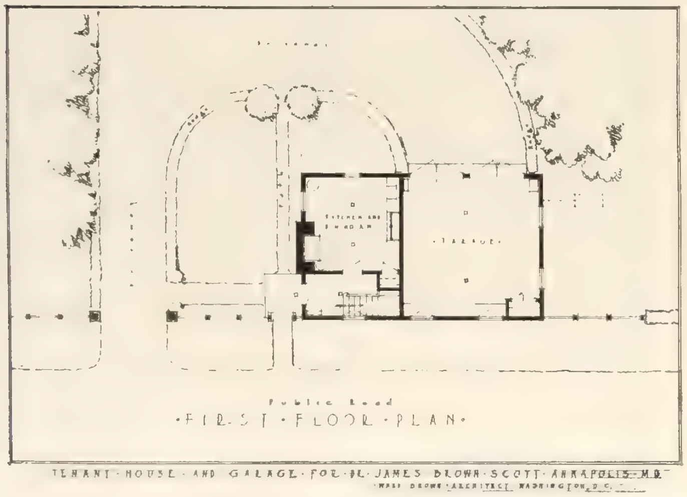
ENTRANCE DETAIL.

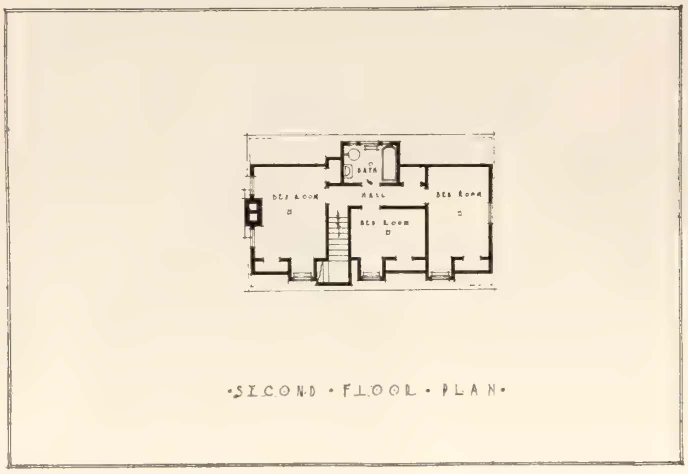


THE STALLS AND CORRIDORS.

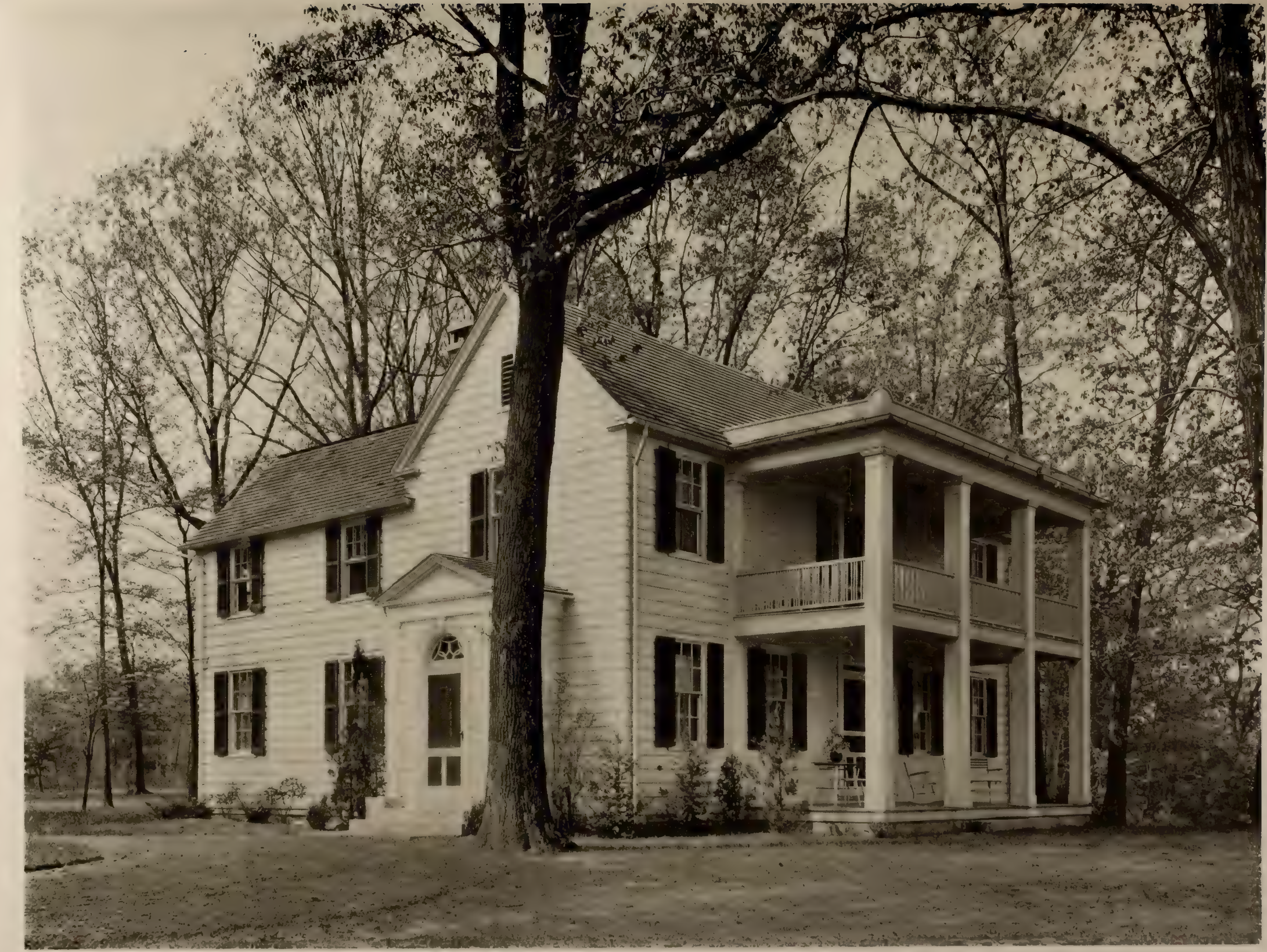
NEW MUNICIPAL MARKET-HOUSE, SAN ANTONIO, TEXAS.
Beverly W. Spillman, Architect.




Public Road
·FIRST·FLOOR·PLAN·
KITCHEN AND DINING ROOM
GARAGE
TENANT·HOUSE·AND GARAGE·FOR·DR·JAMES BROWN·SCOTT·ANNAPOLIS·MD
WARD BROWN·ARCHITECT WASHINGTON, D.C.

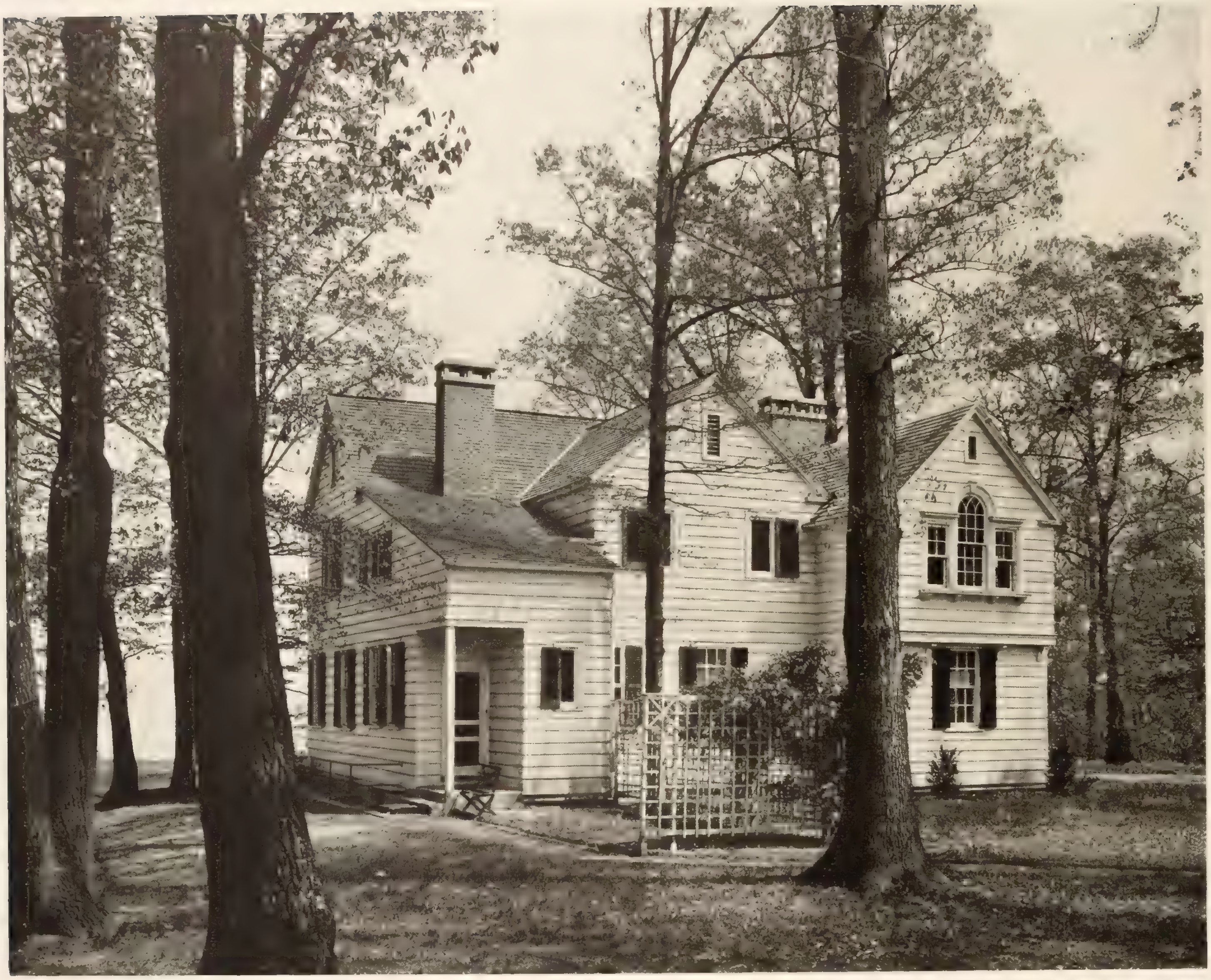


ENTRANCE GATES, LODGE, AND GARAGE, DOCTOR JAMES BROWN SCOTT, ANNAPOLIS, MD. Ward Brown, Architect.

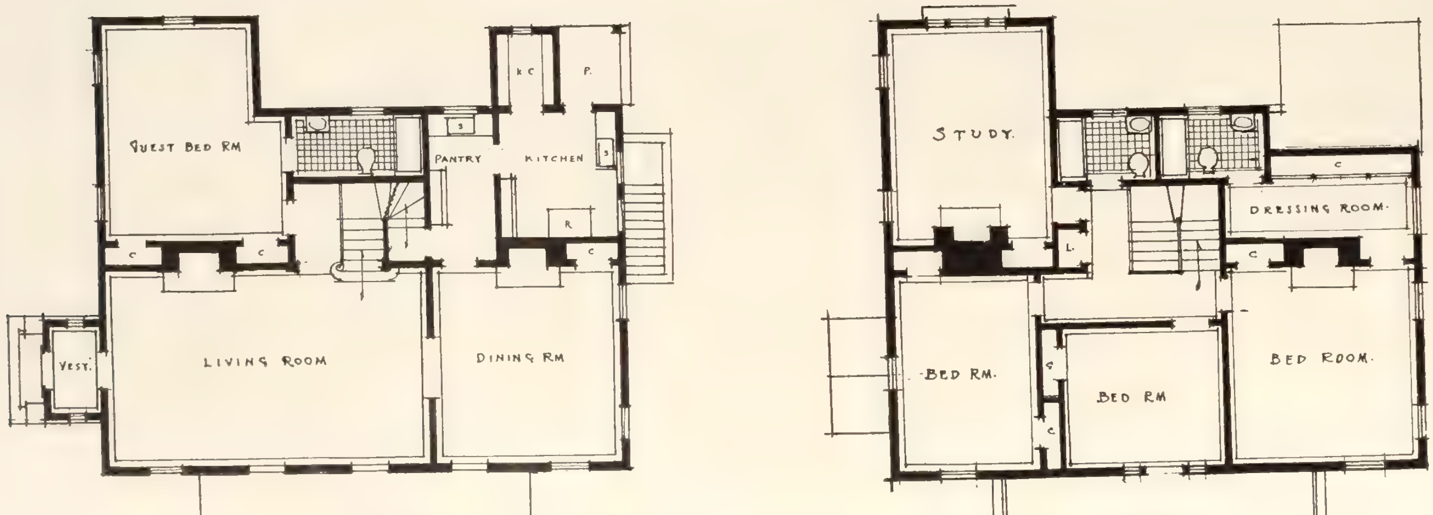


RESIDENCE, DOCTOR JAMES BROWN SCOTT, ANNAPOLIS, MD.

Ward Brown, Architect.



REAR OF RESIDENCE.



RESIDENCE, DOCTOR JAMES BROWN SCOTT, ANNAPOLIS, MD.

Ward Brown, Architect.

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Editorial and Other Comment

Honoring the Crafts

"WHILE the last brick was being laid and the last stone set on the Barclay-Vesey Building, New York City, September 10, 1925, all trades on the job stood by at the dedication of the largest telephone building in the world. Following the dedication, certificates of award were presented to Matthew D. Mahoney, bricklayer, and George S. T. Bain, stone-cutter, in recognition of superior craftsmanship shown by them on the job by Stephen F. Voorhees, president of the New York Building Congress as well as a member of the architectural firm of McKenzie, Voorhees & Gmelin, who designed the building."

After all is said and done, it is the good work of every individual associated with a great building enterprise that makes the final result good or bad. From the designer to the humblest laborer the obligation of honest service is to be reckoned with. In this case the two crafts especially identified with a remarkable structure were chosen for special recognition. We can imagine the pride and satisfaction in the minds of both these men, who were made a part of the ceremonies of dedication, and we can understand how their fellow workmen rejoiced with them in this signal recognition of unusual skill and thoroughness. It would be well if such things might more often be made the occasion for public acknowledgment. We read and talk a lot, at times, of the wonderful unity of spirit and pride in work shown by the old mediæval craftsmen, but human nature hasn't changed so much with the coming in of modern efficiency methods and skyscrapers, and as for pride in work, few workmen of old had the privilege of being identified with such a really marvellous achievement as is represented by almost any of our great business buildings.

Mr. William O. Ludlow, of Ludlow & Peabody, chairman of the Committee on Recognition of Craftsmanship of the Building Congress, explained the Congress idea to recognize superior craftsmanship in the different trades in the industry. He said that it was a privilege to help in the production of this building and that it was an honor to recognize superior craftsmanship in its construction. He explained that the certificates were not awarded to the men who laid the greatest number of brick, but to men who put spirit and energy as well as muscle into their work.

Quality, not quantity, is emphasized. Those two essentials of every real achievement the world has known, "spirit and energy," were never more in evidence than in these tremendously inspiring times. The "spirit" prompts men to new enterprises of daring involving the expenditure of incredible sums of money, and the "energy" that makes for organization and conservation is ready to carry them on successfully.

Too Much Organization

THAT we are overorganized in a multiplicity of ways, too ready to join any old boosters' club, too prone to hurrah for the glib-tongued speaker who tells us that what we need to do "is to organize," comes home to most of us with constantly increasing insistency. We are naturally a gregarious people, one hundred per centers or less, and most of us are ready to gather over a dinner or a luncheon and pledge some more precious time and small change to the new movement. Unhappily, it is not only in the minor ways of business life that we are overorganized. Nationally we are the victims of a Congress that seems to think that the public at large needs to be regulated along kindergarten lines. The individual's right of initiative, right of personal ways of living, right to pick and choose what he shall eat and drink, right to the property he may accumulate by industry and self-denial, are regulated by a mass of laws that are obfuscating even the minds of the legislators who devise them.

Make a noise, beat the tom-tom, cheer and hum jazz tunes, keep smiling, and the world pauses to observe just long enough to get the rhythm and join the parade. The thing about the multiplying organizations that easily becomes a serious burden is the constant demand for another little contribution. In the course of time these small amounts pile up, and even more than the money cost is the cost in time, if you keep up your interest.

Few industries are more cluttered with organizations than building. In a recent address by Colonel William A. Starrett he hit the nail on the head good and plenty when he said:

"In the building industry it is a peculiar fact that we are cursed with a great many things, especially with a multiplicity of organizations.

"There is an interesting fact about these organizations. They are gotten up with the best of intentions, and the intentions are never to be questioned as being good—they are always good—but people in the burst of enthusiasm, small or large groups, decide to organize something, some particular difficulty in our much beset industry is looming up in front of us and somebody has a remedy, so an organization is gotten up to do something with it. It is interesting how we can get our friends. Everybody has a circle of friends who will come in and quickly pitch in a hundred dollars or some amount and start the organization. That has been the history in the past. These organizations that have lived and died have shown a peculiar curve of membership right up to the top, and then they have faded away again. I speak of this more from observation than from any statistical knowledge, but I know it is so. I think if we could—and I think yet we will—compile a list of those dead organizations that have existed in the building industry you will be perfectly astounded, and some of you will see familiar names when that list is compiled, as I think it should be compiled."

The duplication of effort involves a vast amount of waste in many ways.

The Chicago Tribune Building

WE had the distinction of publishing the winning design for the Chicago Tribune Building, together with a number of the competitive designs, and we thought at that time that the award had been well placed. The finished building confirms us in this attitude.

It is a fine achievement, imposing in mass and well-considered detail. The architects are to be congratulated, and we doff our hat again to the great city by the lake. She is happily placed so she can go on spreading all over the country. Her increasing number of skyscrapers need never create the conditions that prevail in our narrow down-town streets.

The Tribune Building is not only impressive architecturally, it is the symbol and expression of power of a great newspaper, whose influence is incalculable. Its tentacles reach out all over the world, and its influence for good or evil on the public mind is beyond expression in any mere words.

Modern newspapers, as represented by the Chicago *Tribune*, our own *Herald Tribune*, the New York *Times*, with their own splendid buildings and complete modern equipment, to name only a few of these great organizations, are keeping pace with the speed of the tremendous human audiences they reach and influence.

Peter B. Wight

PETER BONNETT WIGHT, student of art and life, builder, and designer, early a fellow and for many years a secretary of the American Institute of Architects, passed away at his home in Pasadena on Tuesday, September 8, 1925, at the advanced age of eighty-seven years.

With his civic and social mindedness, Mr. Wight became, and continued to be, a factor in the architectural life of Chicago, in which city he passed the greater part of his professional career.

Mr. Wight's contributions to the professional literature were many, varied, and instructive. His history of the Chicago Chapter of the A. I. A. teems with interest and will long keep his memory green in the hearts of its members, his friends, to whom, as to all, he gave himself without stint.

Whereas: In the passing of Peter B. Wight the chapter and the profession have lost a vital force for good, a companionable and friendly spirit; therefore be it

Resolved: That the Chicago Chapter A. I. A. record its deep sense of loss and that these words of respect be spread upon the records of the chapter and be transmitted to the intimate family through the beloved sister who ministered to the talented brother in his declining years.

(Signed) IRVING K. POND,
ARTHUR WOLTERSDORF,
for the Chapter.

For the Australian War Memorial

WE are advised by the commissioner for Australia, Sir James Elder, that an architectural competition will be held for the design of the Australian War Memorial, which it is proposed shall be erected at Canberra, the capital of the Commonwealth of Australia.

This competition is open to architects resident in Australia, or architects abroad who are of Australian birth. The competition is limited to architects resident or born in Australia. There are, no doubt, a number of architects of Australian birth practising in America, and in addition there are Australian architectural students in this country.

Printed conditions regulating the submission of designs may be obtained upon application at the office of the official secretary to the Commonwealth of Australia in the United States of America, 44 Whitehall Street, New York, U. S. A., to whom designs must be delivered as prescribed, not later than 12 noon on Wednesday, March 31, 1926.

A New Competition for the Octagon House Inscription

EARLY in the year prizes were offered in a competition which closed April 1, 1925. It was expected that awards would be made at the exhibition in connection with the Fifty-eighth Convention in April. The jury, of which Mr. Howard Van Doren Shaw acted as chairman, reported that none of the designs submitted were suitable for the purpose, and the jury decided to make no awards. This result was a disappointment to the undersigned, as it must have been to those who sent in drawings. Most of the designs submitted were too monumental and out of scale with the building, while others were not in keeping with the dignity of the building.

A new competition is hereby announced, and those who have made studies are urged to revise them or make new ones for submission. All others interested also are invited to participate.

The building committee desires through a competition to secure a design for a tablet, sign, or historical device which will be dignified and refined, and at the same time sufficiently conspicuous to attract the attention of the passer-by. The purpose is to inform the public as to the historic and architectural importance of the building.

The following inscription is suggested:

THE OCTAGON HOUSE
ERECTED IN 1800
OCCUPIED BY PRESIDENT MADISON WHEN
THE WHITE HOUSE BURNED IN 1814.
THE TREATY OF GHENT WAS RATIFIED HERE.

HEADQUARTERS OF
THE AMERICAN INSTITUTE OF ARCHITECTS

The inscription may be varied at the pleasure of the competitors.

It is suggested that the memorial device take the form of a wall tablet to be fastened to the building, or an inscription in individual bronze letters let into a stone or granite sidewalk leading to the front entrance, or a sign on a pole or standard. Each competitor is at liberty to follow any idea of his own or to suggest an alternative.

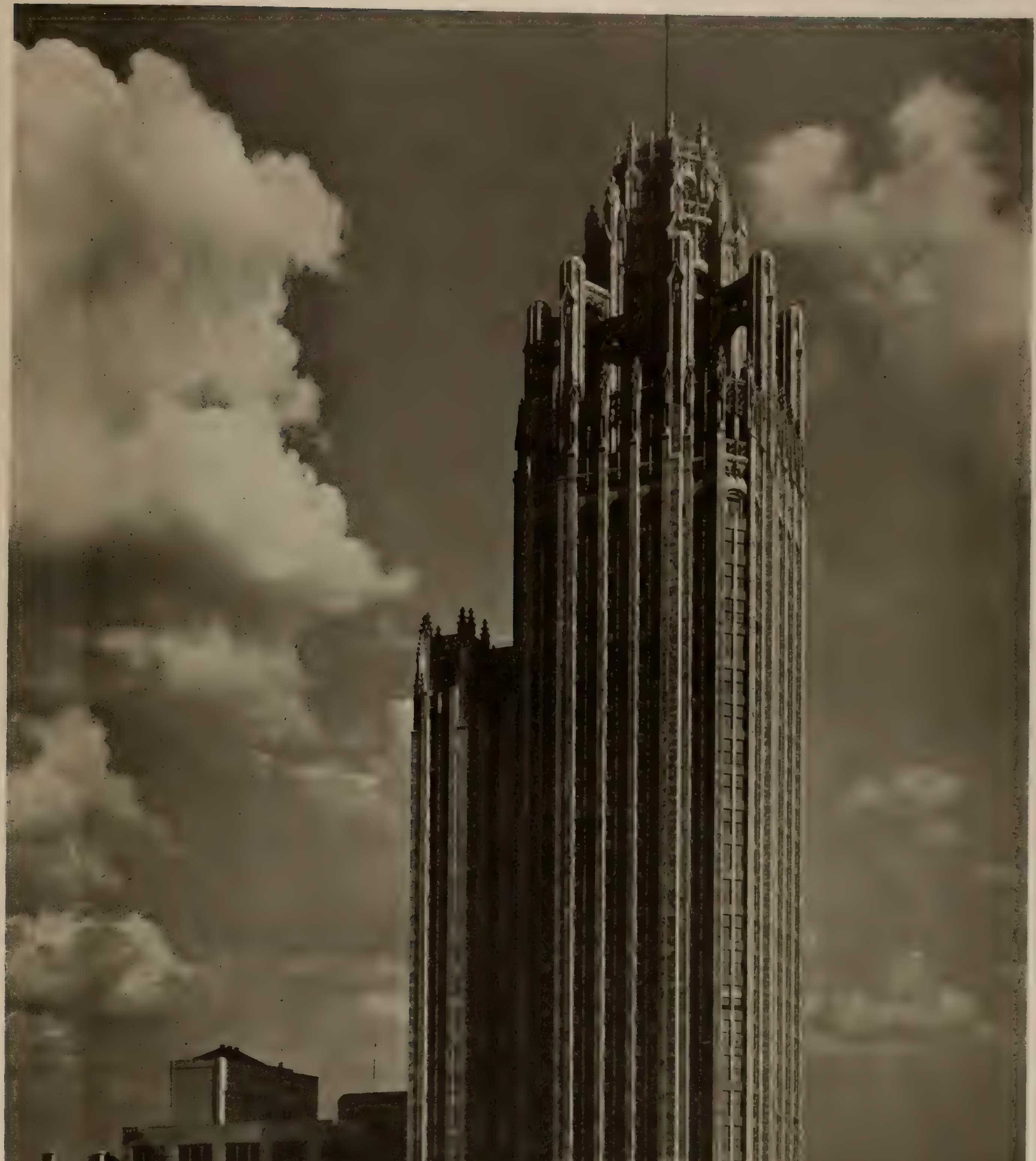
Competition is open to all architects and draughtsmen.

Drawings should not exceed 24 by 36 inches.

Rendering and scale at option of competitor.

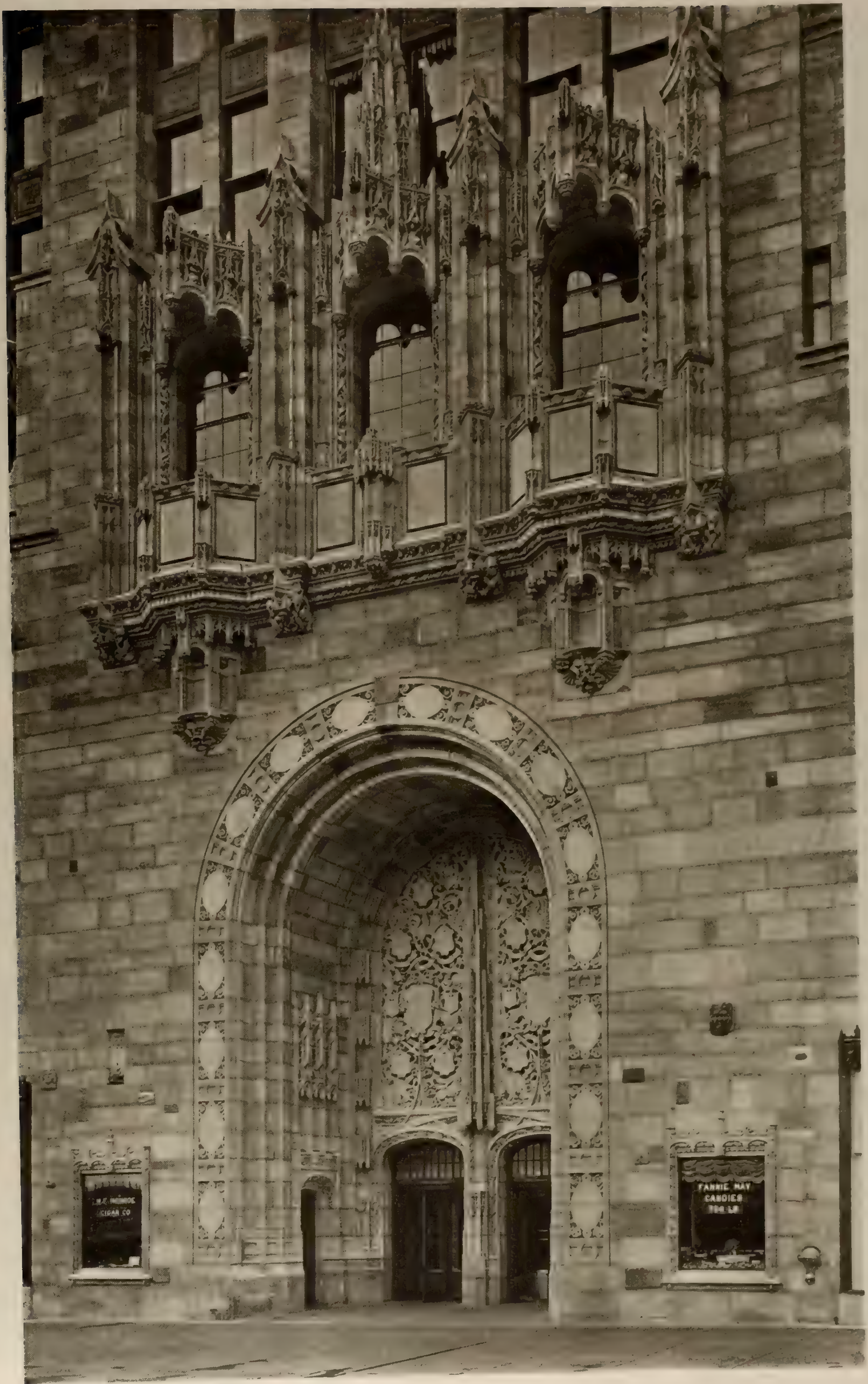
Drawings shall be delivered anonymously to D. Everett Waid, 1 Madison Avenue, New York City, N. Y., on or before January 1, 1926, with the name and address of the competitor enclosed in a plain sealed envelope.

Prizes will be awarded by the building committee as follows: First Prize, $150; second prize, $100; third prize, $50. The jury reserves the right to withhold any prize if in their opinion an award is not deserved.



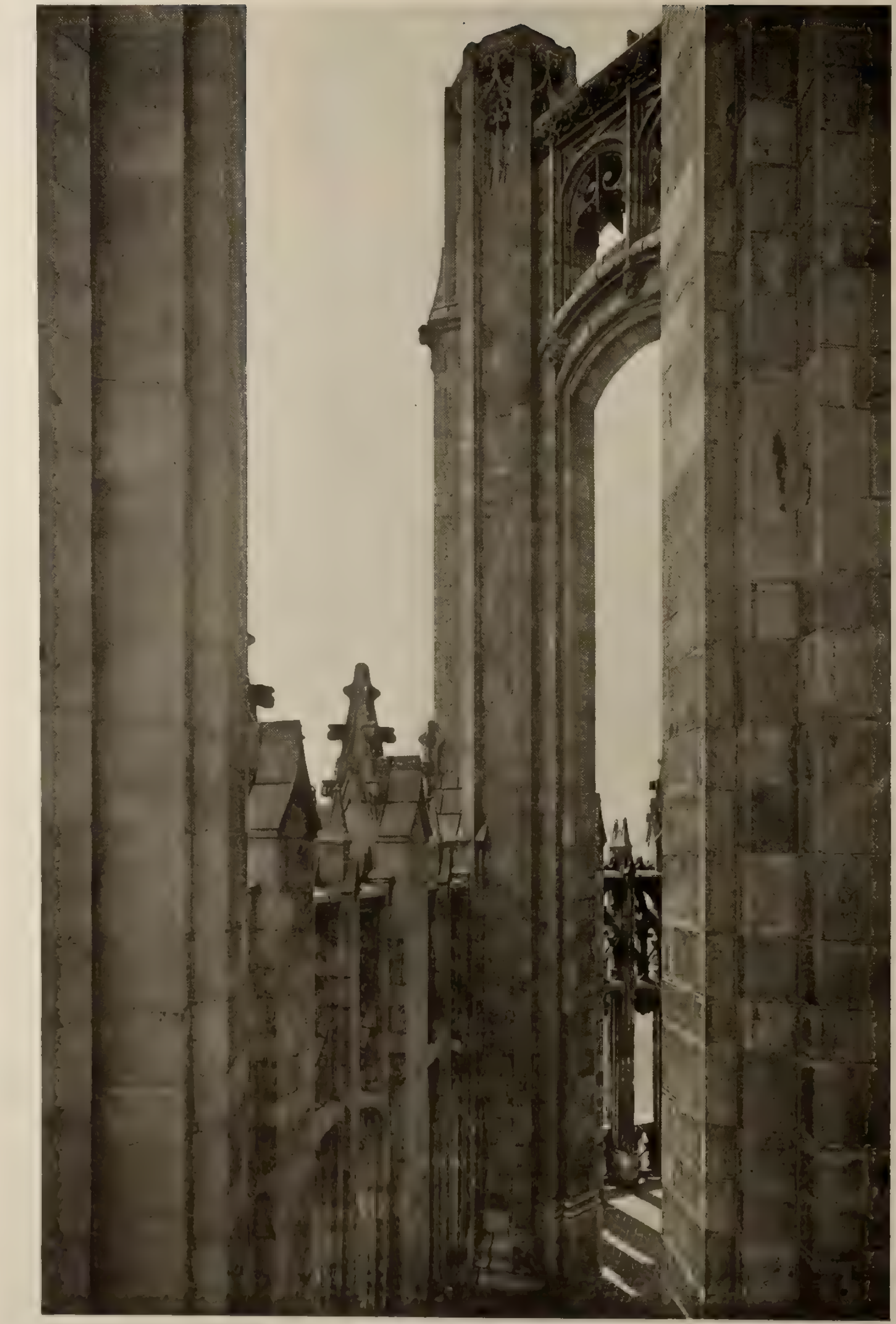
GENERAL ELEVATION, CHICAGO TRIBUNE BUILDING, CHICAGO, ILLS.

John Mead Howells and Raymond M. Hood, Associated Architects.

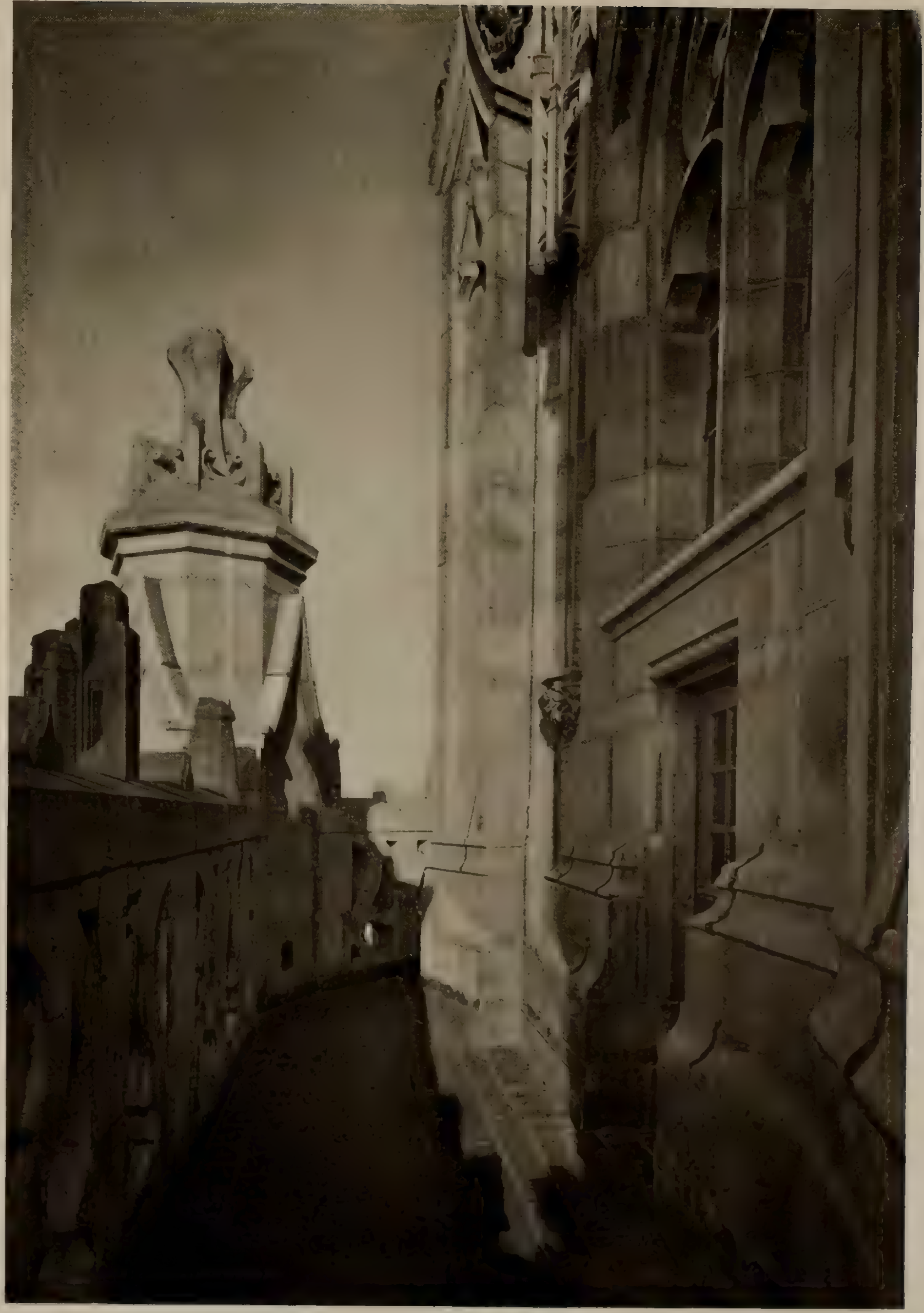


MAIN ENTRANCE (PANELS NOT YET CUT), CHICAGO TRIBUNE BUILDING, CHICAGO, ILLS.

John Mead Howells and Raymond M. Hood, Associated Architects.



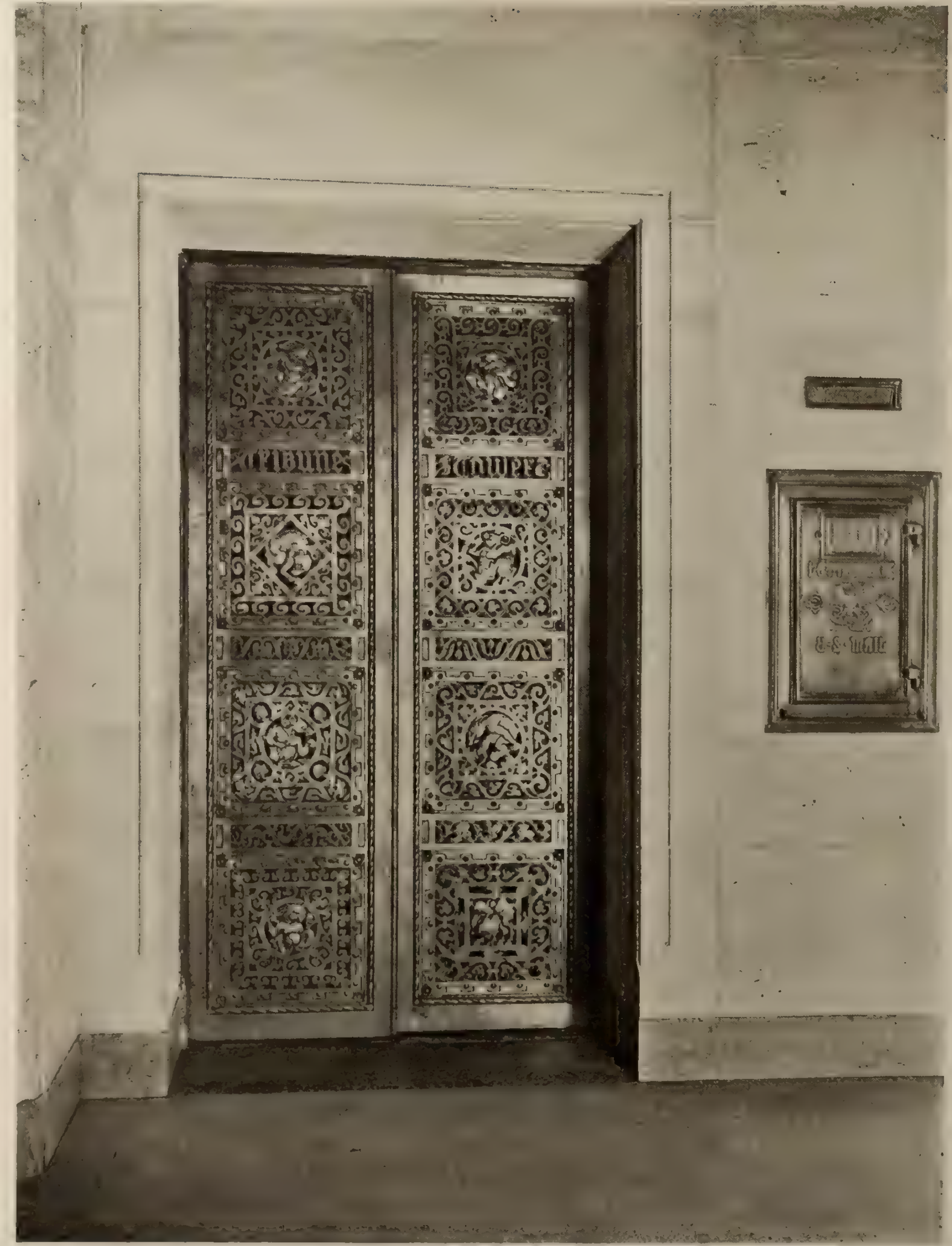
TOURELLE AND GOTHIC SCREEN AT TWENTY-FIFTH FLOOR.



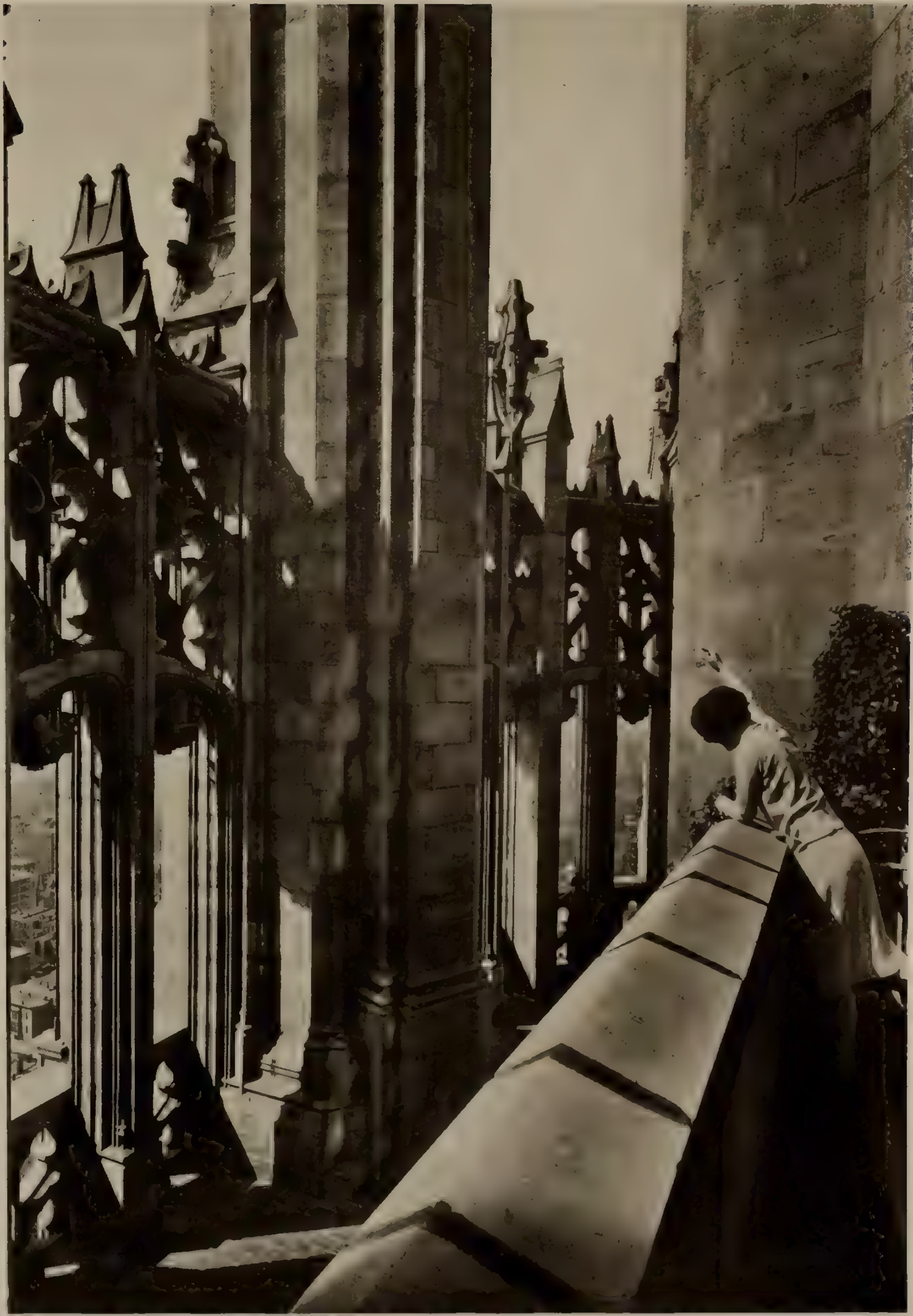
TERMINAL AT TOP OF WING, TWENTIETH FLOOR.

CHICAGO TRIBUNE BUILDING, CHICAGO, ILLS.

John Mead Howells and Raymond M. Hood, Associated Architects.



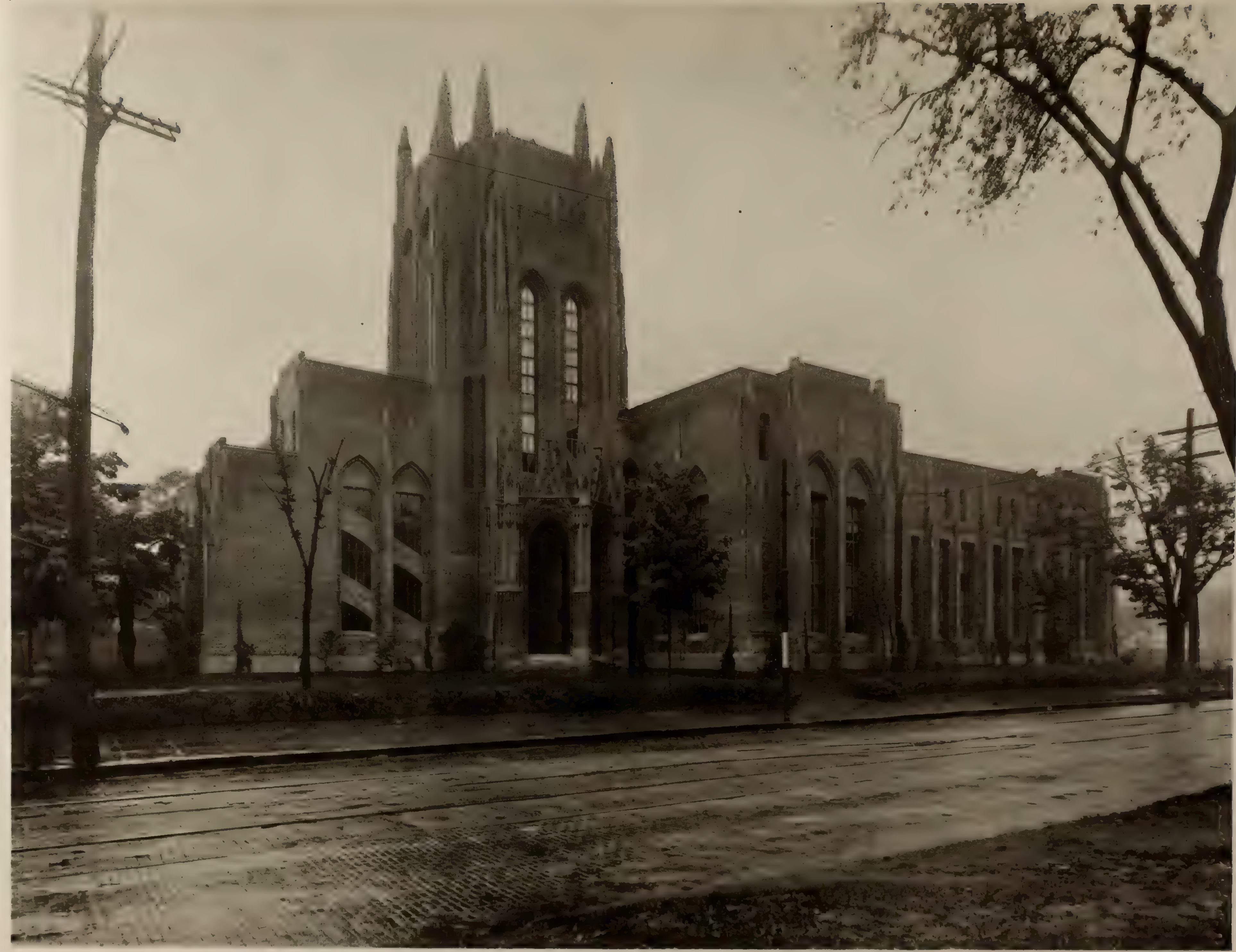
ELEVATOR DOORS.



LOOKING DOWN ON TERRACE AT TWENTY-FIFTH FLOOR.

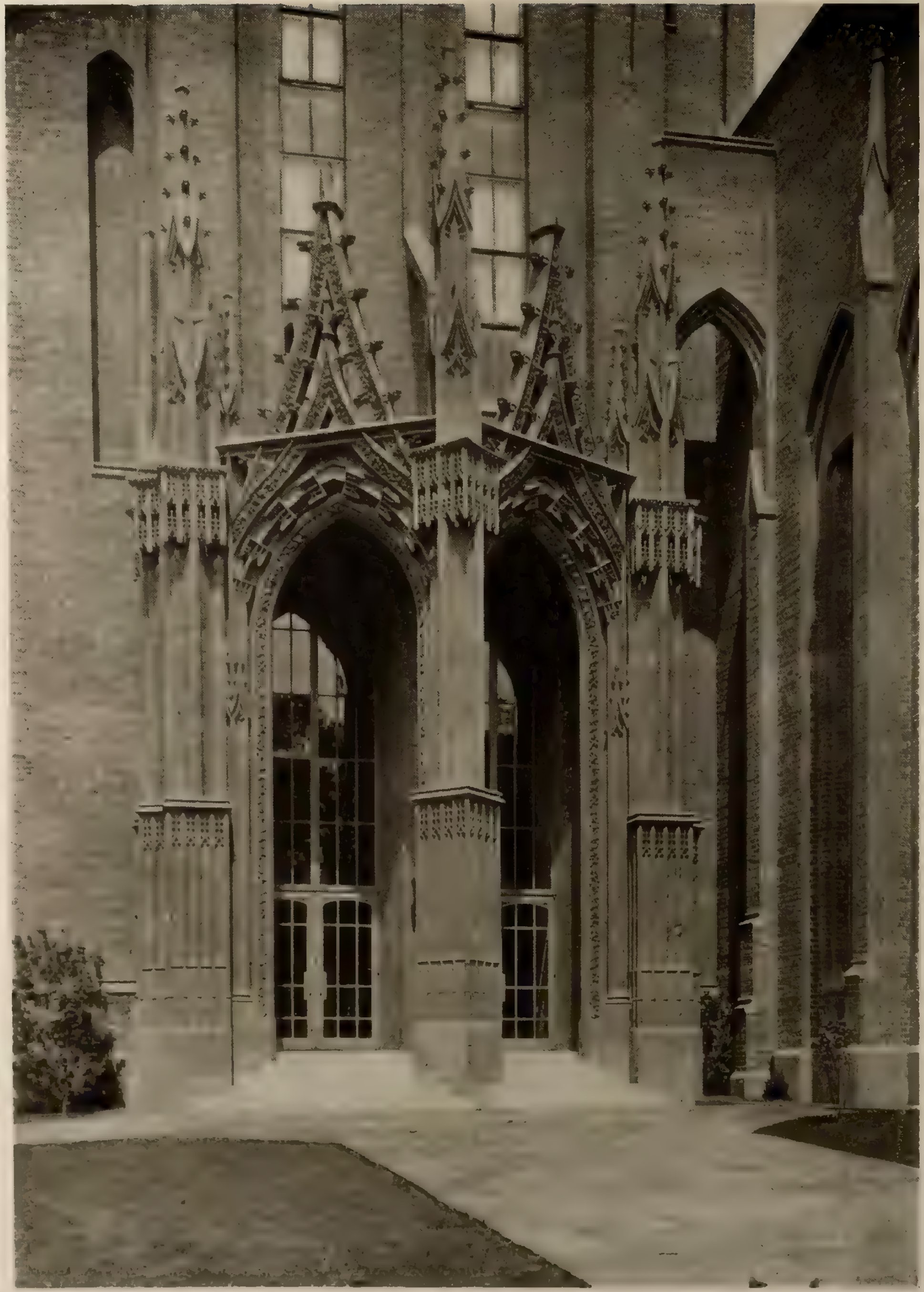
CHICAGO TRIBUNE BUILDING, CHICAGO, ILLS.

John Mead Howells and Raymond M. Hood, Associated Architects.

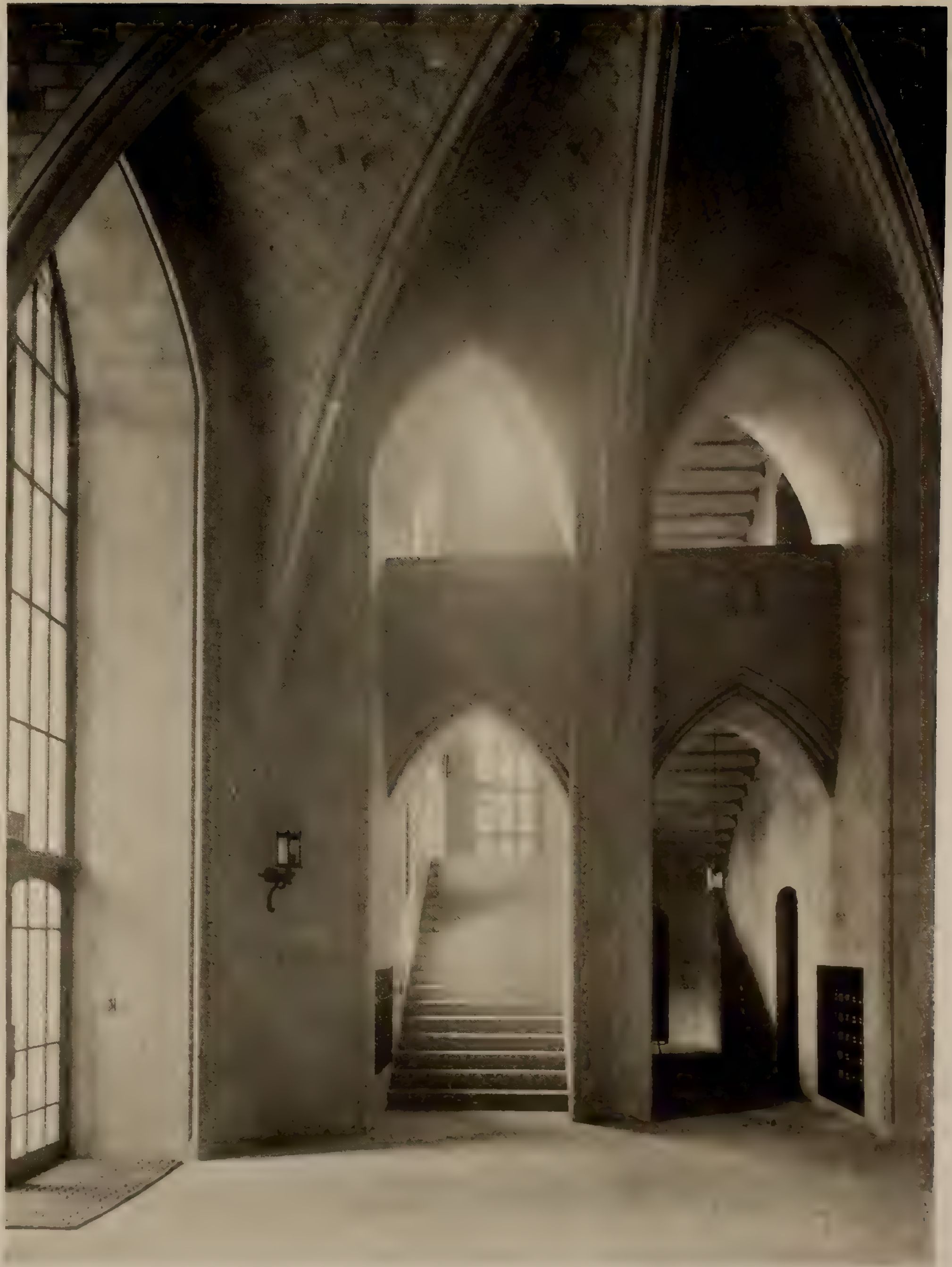


PEABODY MUSEUM OF NATURAL HISTORY, YALE UNIVERSITY, NEW HAVEN, CONN.

Day & Klauder, Architects.



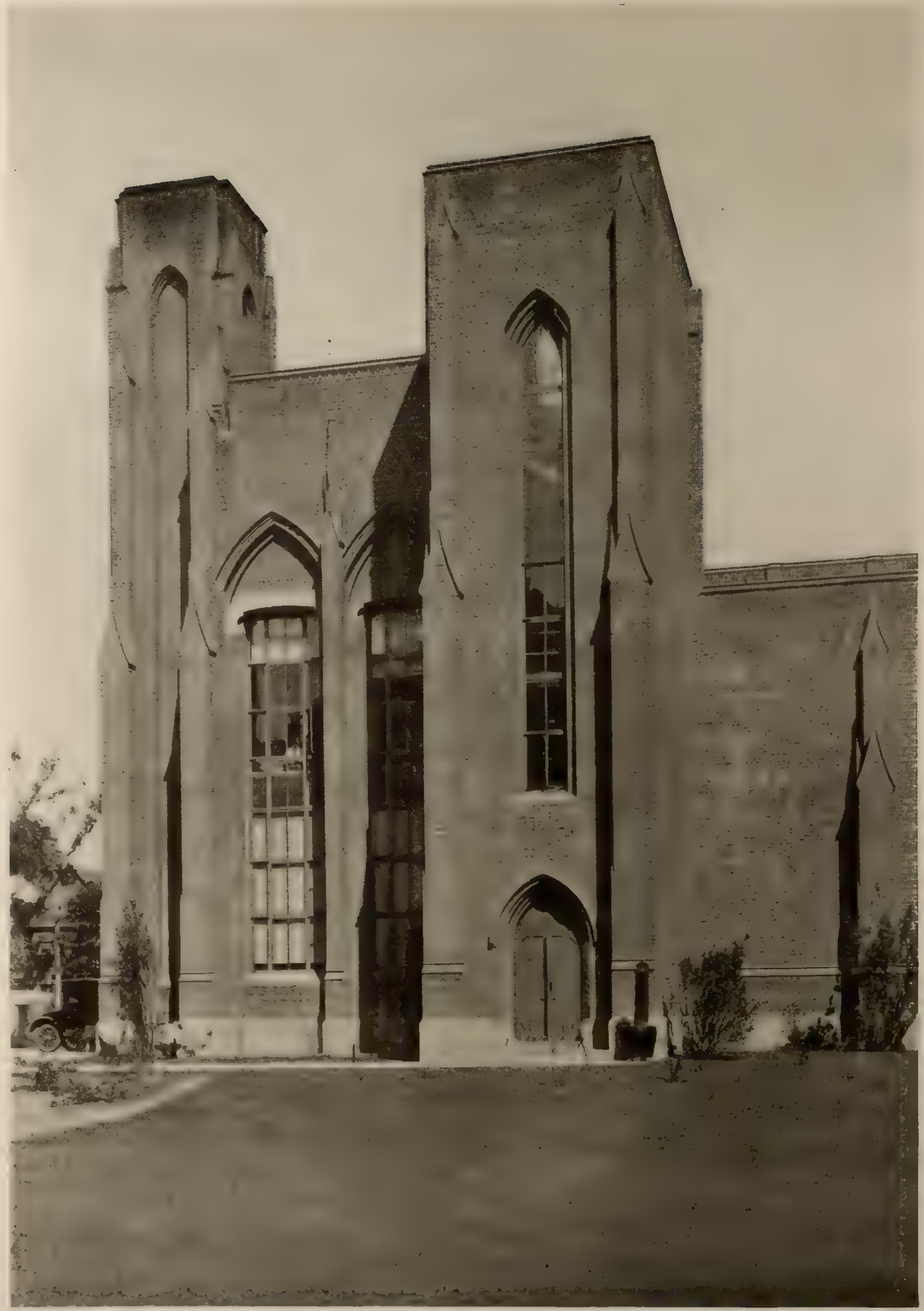
MAIN ENTRANCE DETAIL.

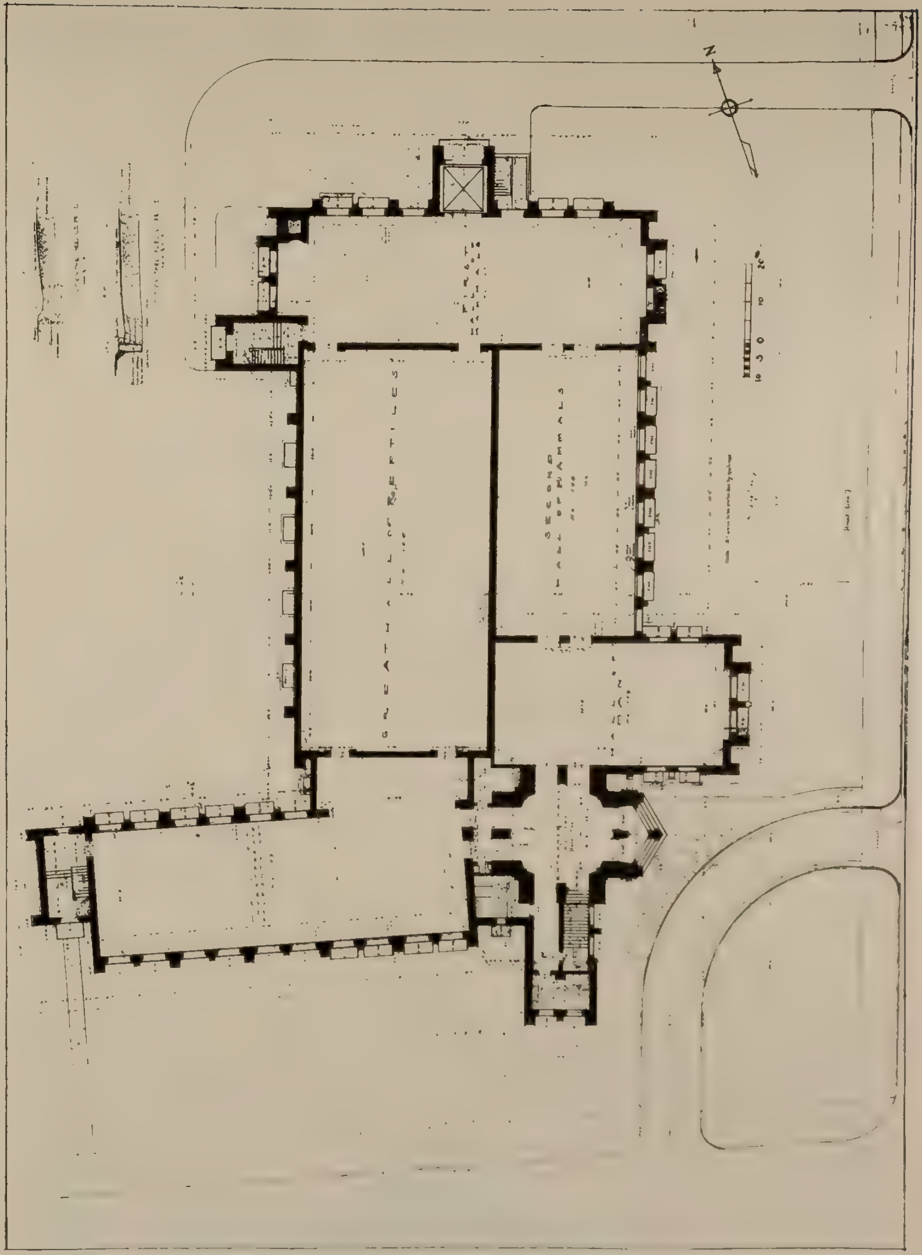


ENTRANCE HALL.

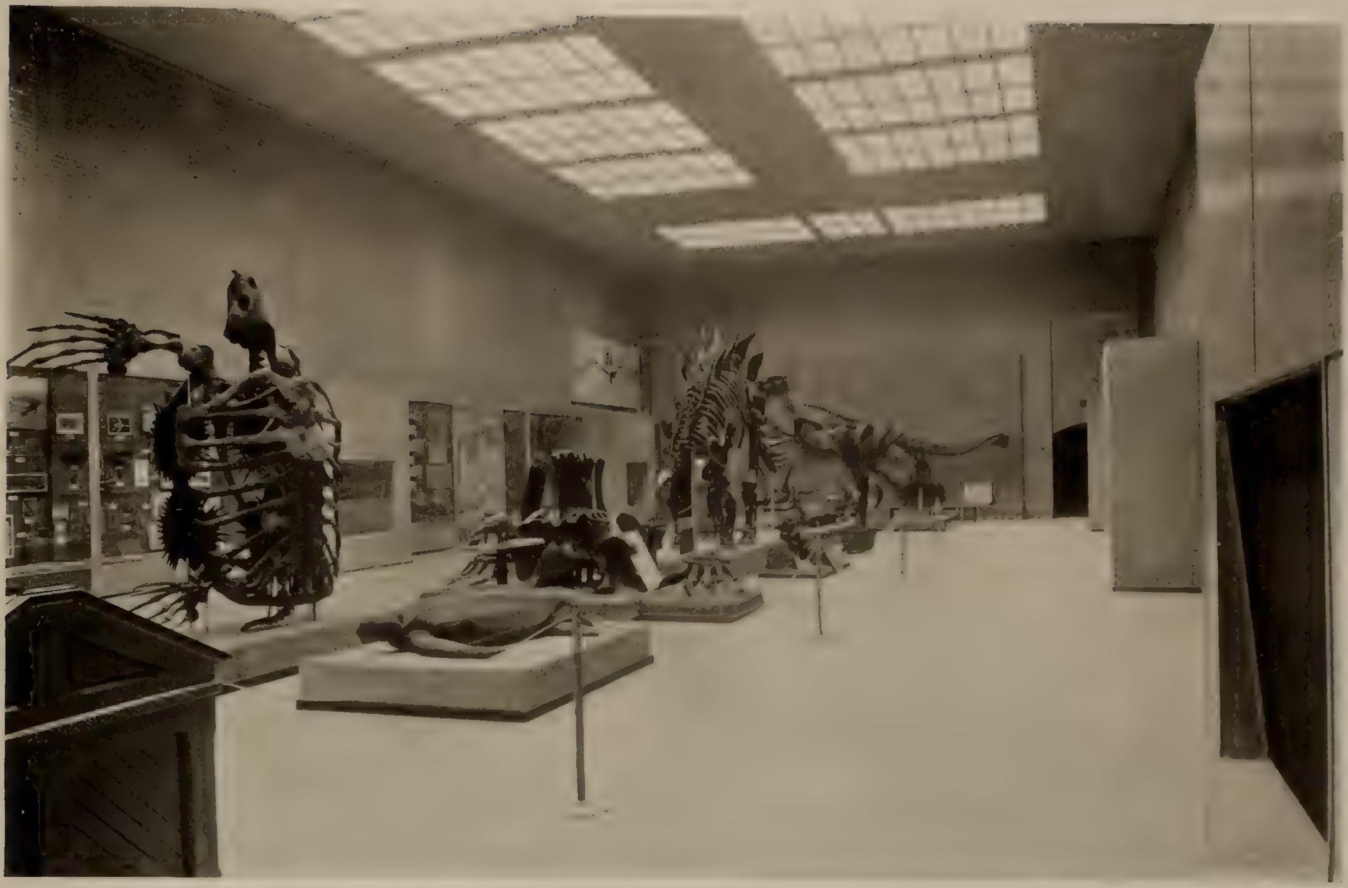
Day & Klauder, Architects.

PEABODY MUSEUM OF NATURAL HISTORY, YALE UNIVERSITY, NEW HAVEN, CONN.

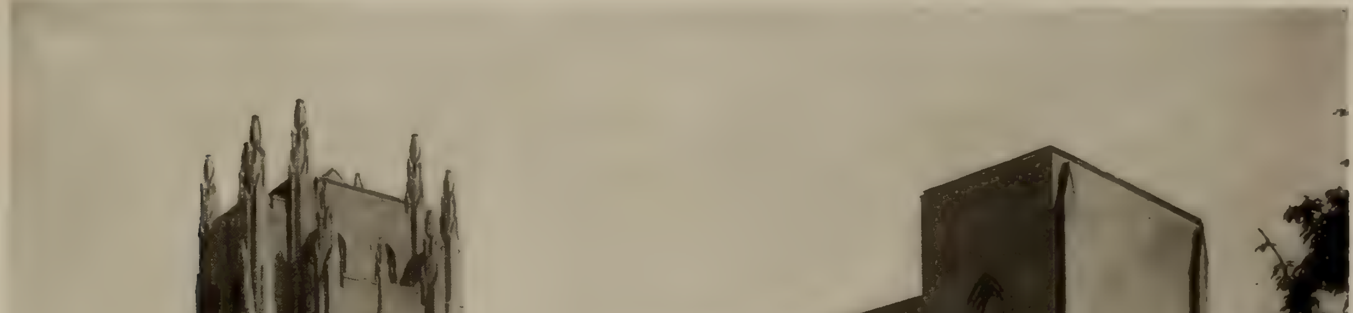




TOWER SERVICE ENTRANCE. PEABODY MUSEUM OF NATURAL HISTORY, YALE UNIVERSITY, NEW HAVEN, CONN. Day & Klauder, Architects.



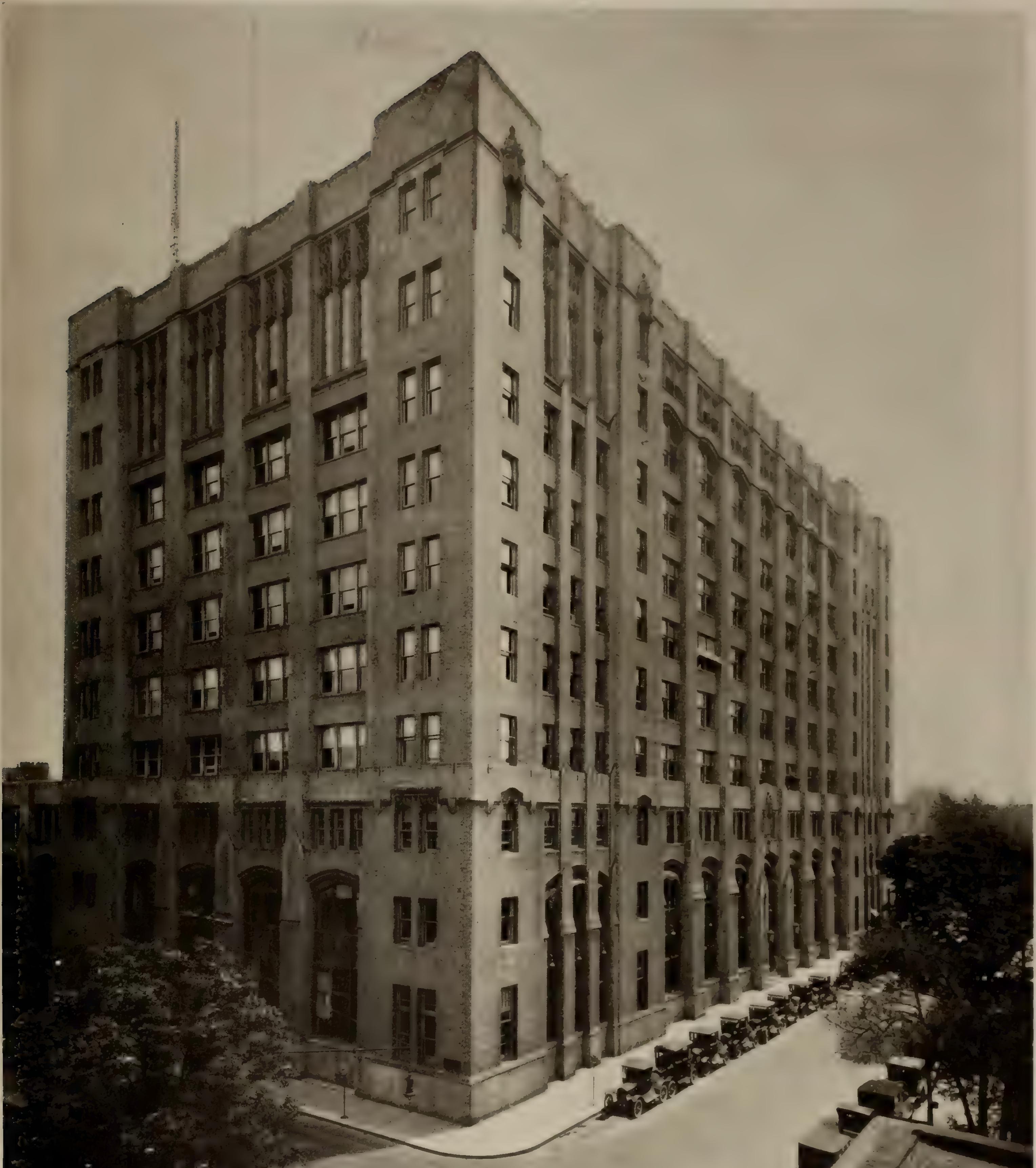
HALL OF MAMMALS.



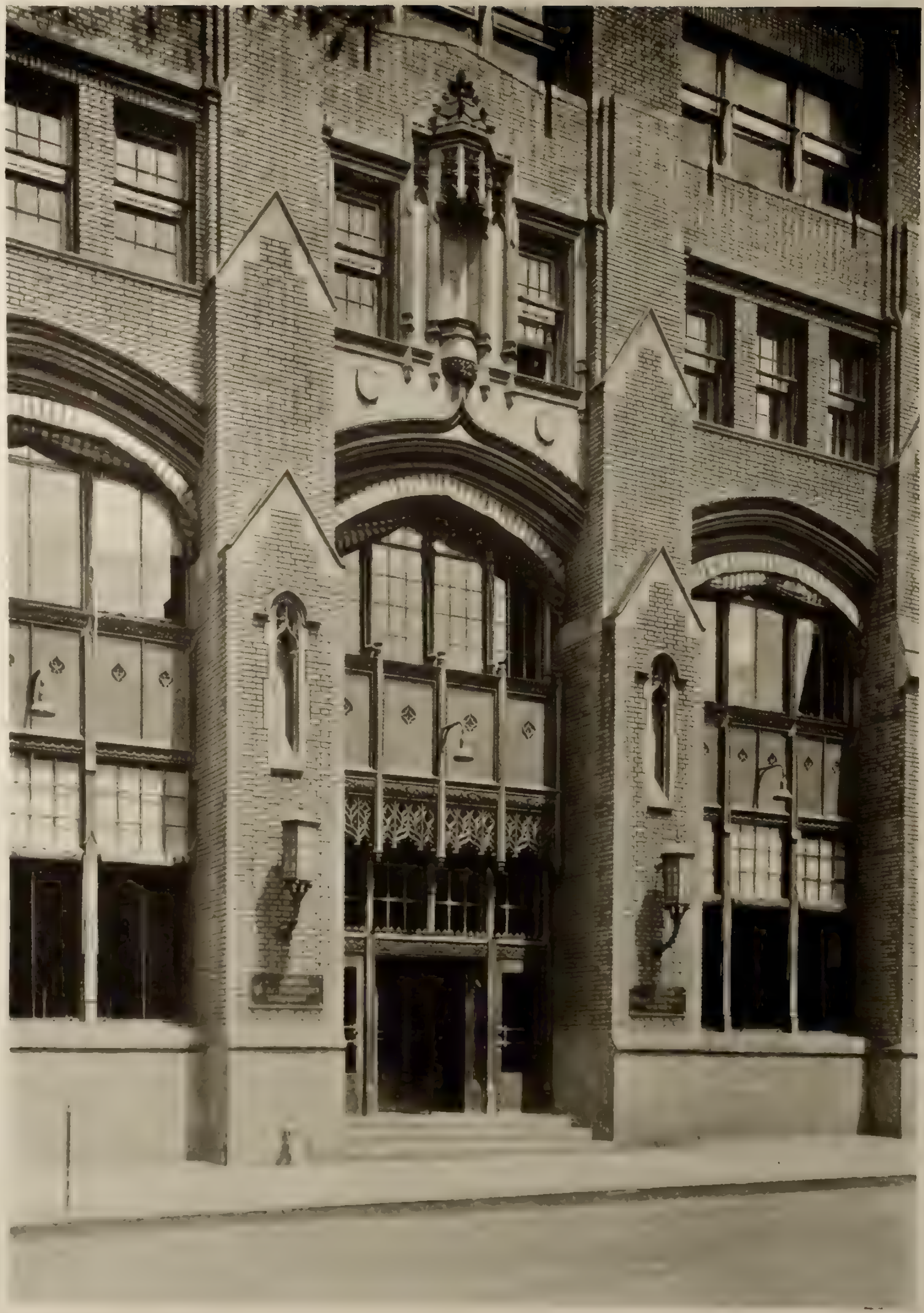
REAR.

Day & Klauder, Architects.

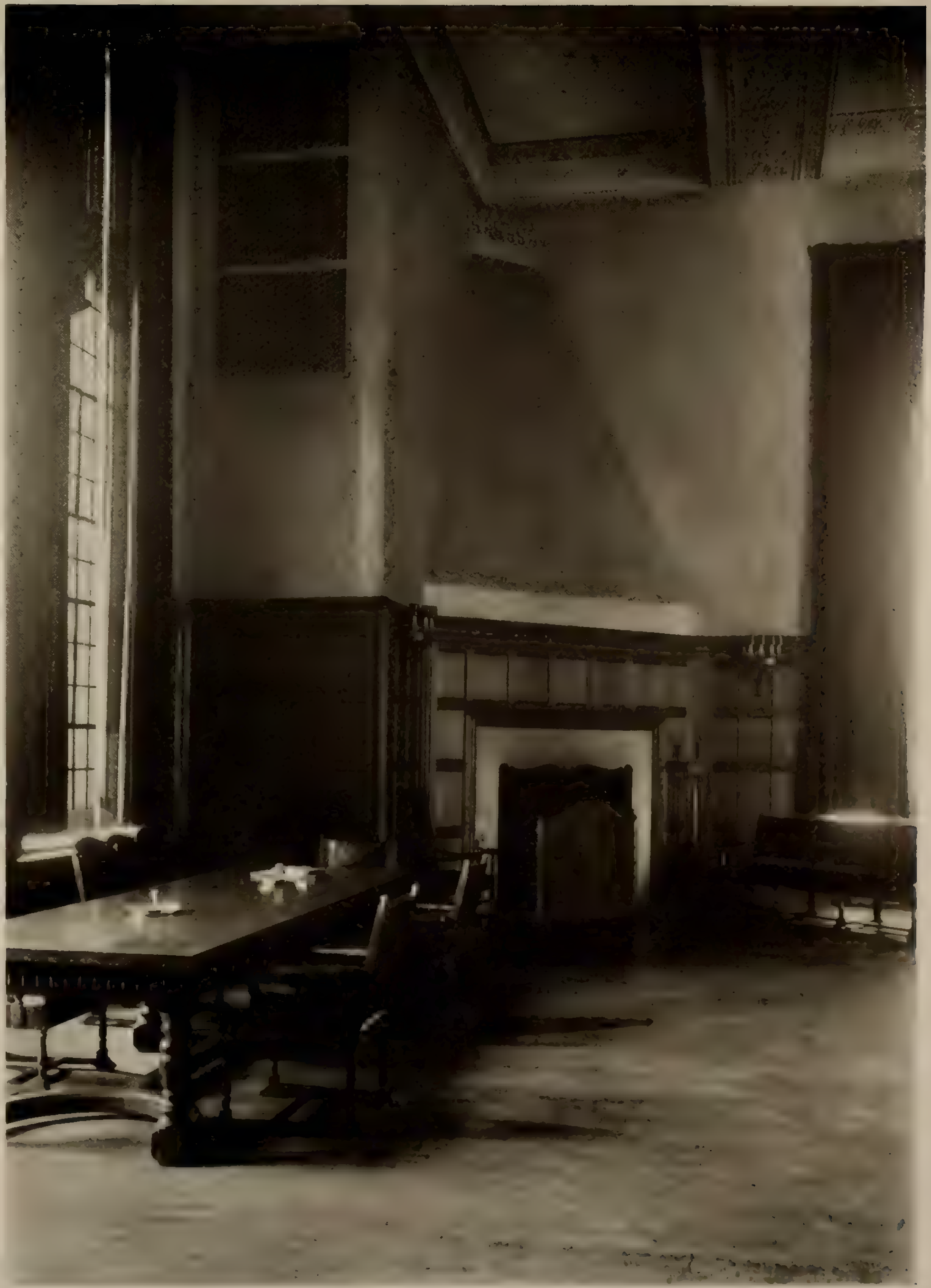
PEABODY MUSEUM OF NATURAL HISTORY, YALE UNIVERSITY, NEW HAVEN, CONN.



DETROIT EDISON SERVICE BUILDING, DETROIT, MICH. Smith, Hinchman & Grylls, Architects.



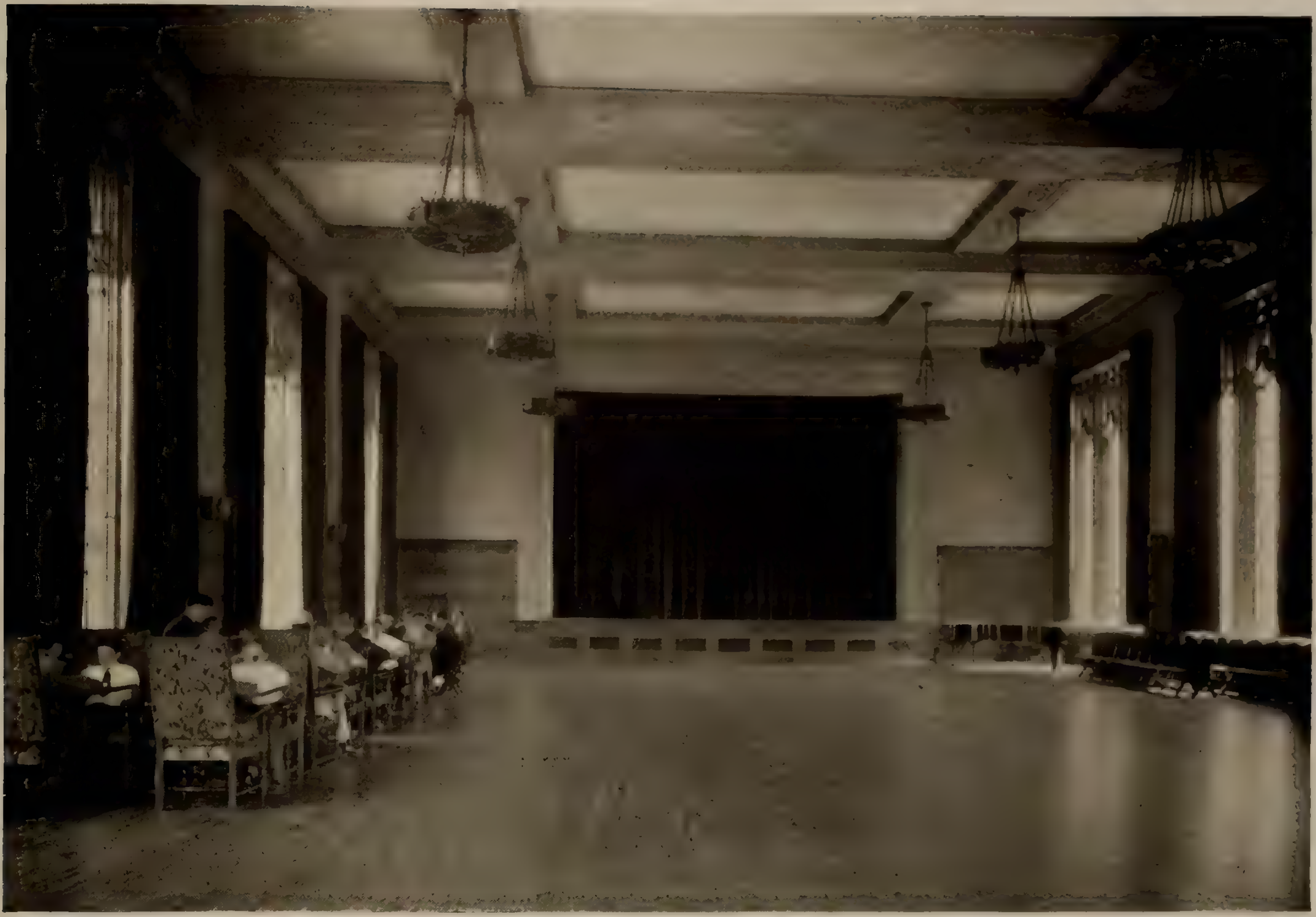
ENTRANCE DETAIL.



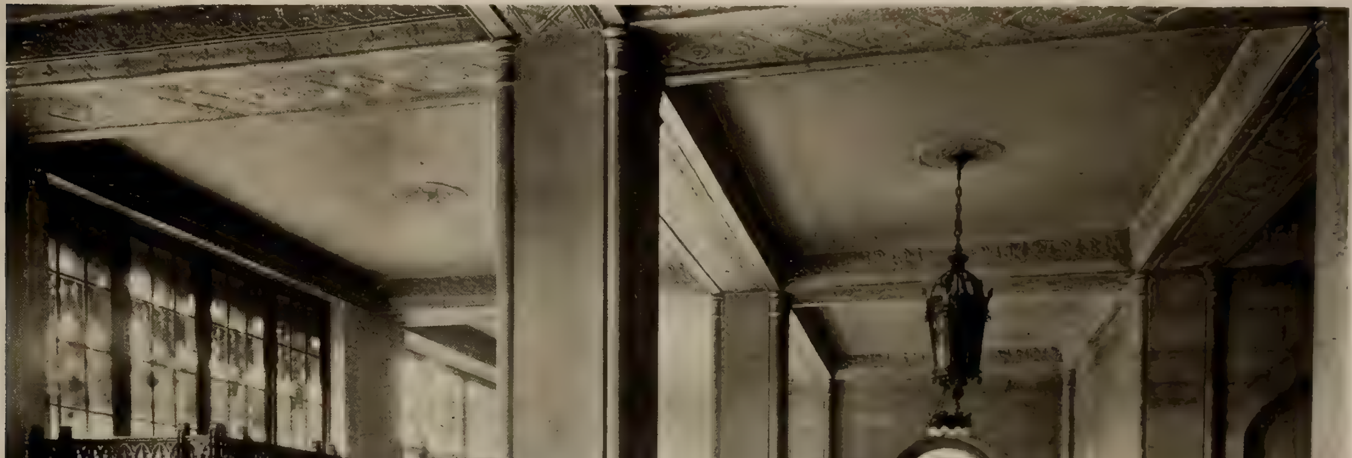
FIREPLACE IN AUDITORIUM.

Smith, Hinchman & Grylls, Architects.

DETROIT EDISON SERVICE BUILDING, DETROIT, MICH.



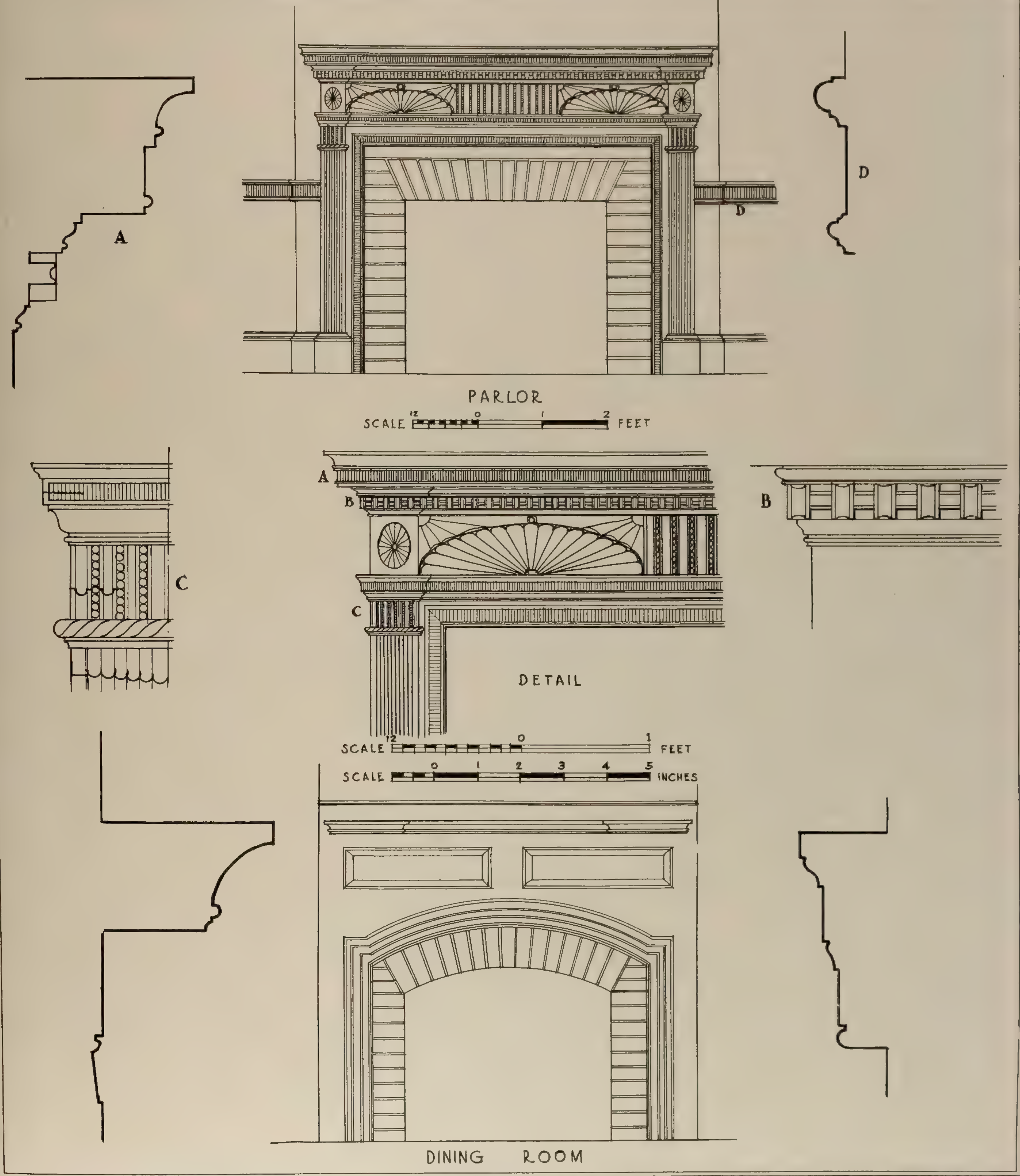
AUDITORIUM.



LOBBY.

Smith, Hinchman & Grylls, Architects.

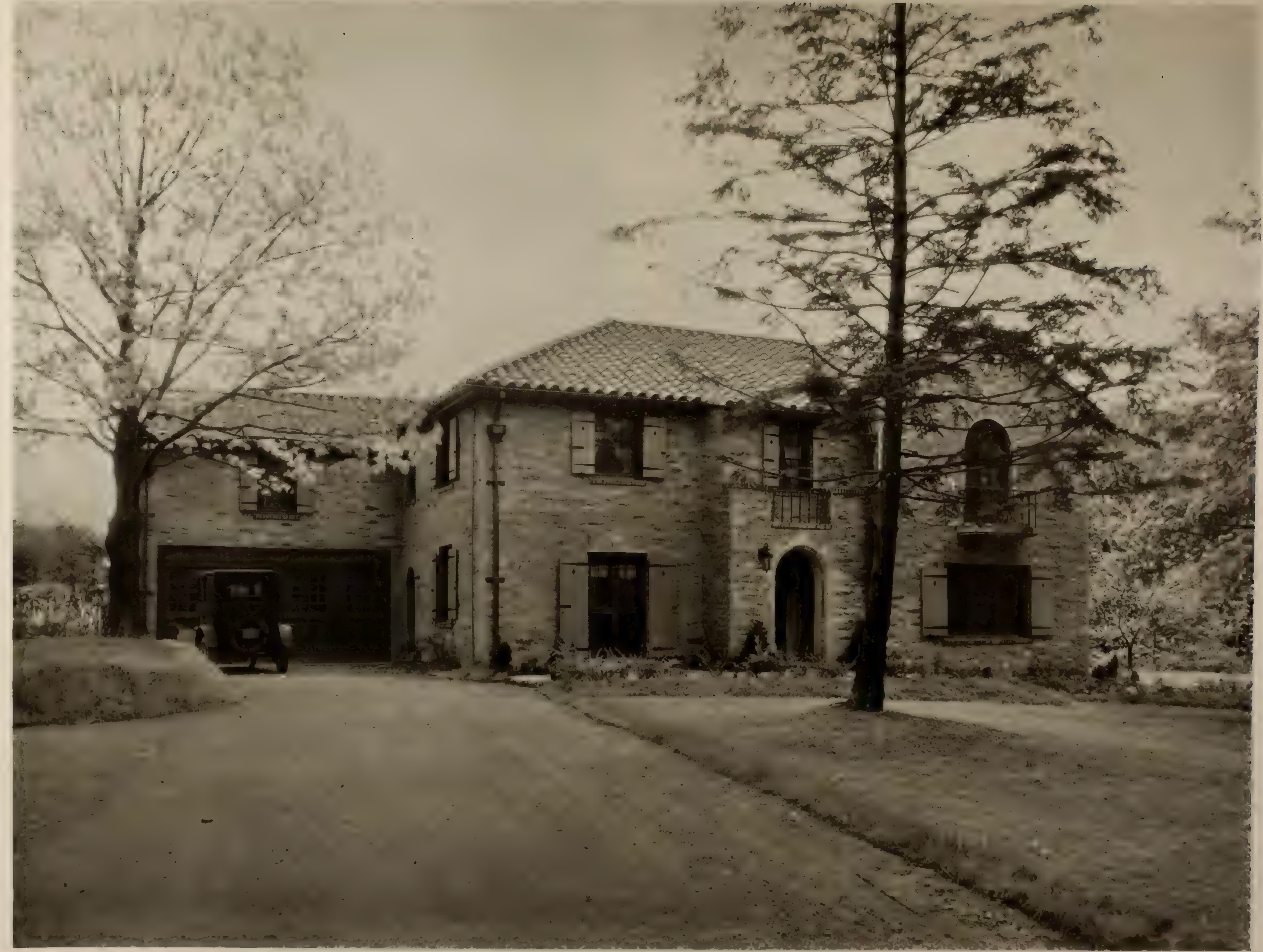
DETROIT EDISON SERVICE BUILDING, DETROIT, MICH.



COLONIAL ARCHITECTURE
OF
MARYLAND

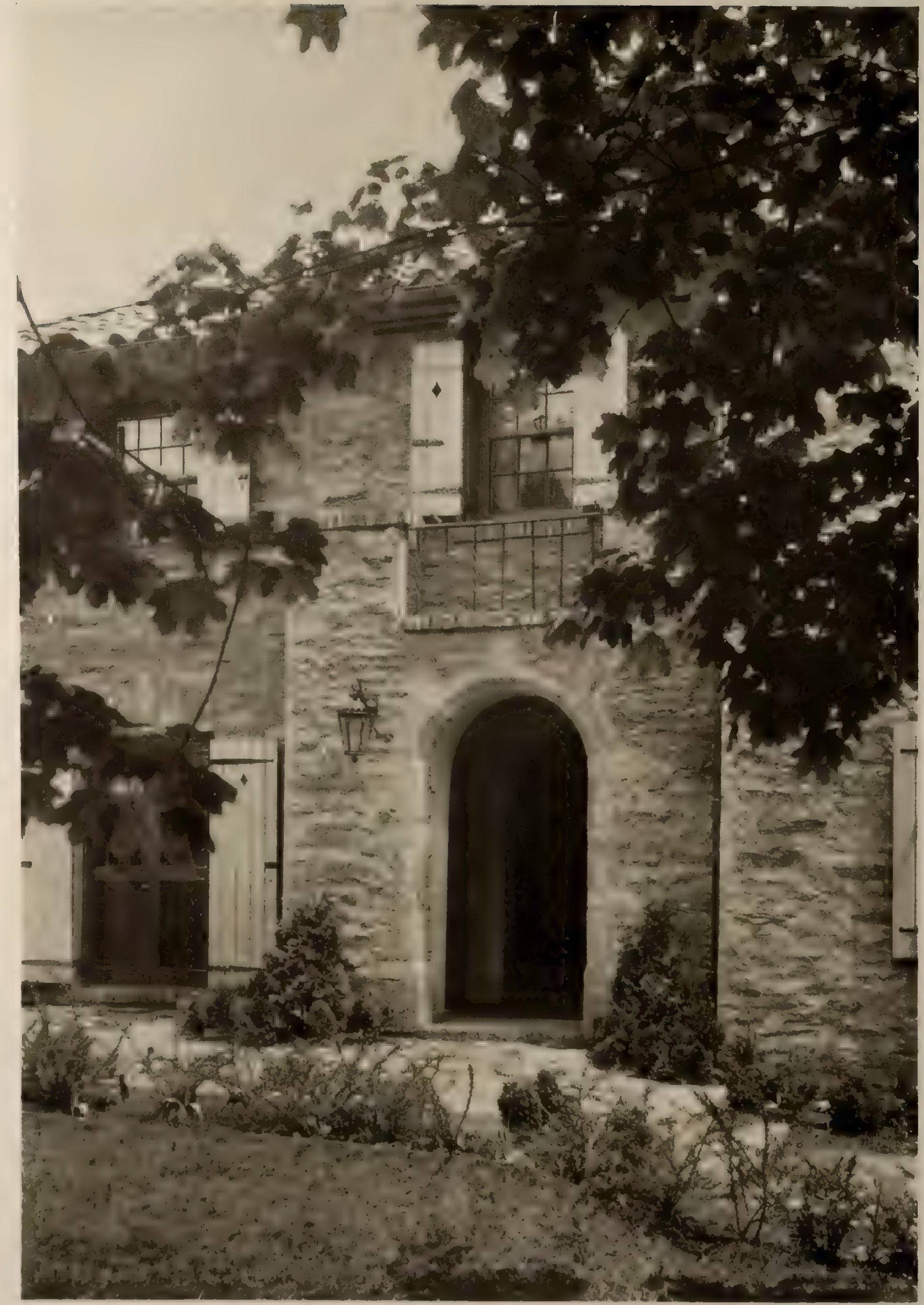
MANTELS IN TAVERN "THE MARLBORO HOUSE"
IN UPPER MARLBORO, ON THE ANNAPOLIS ROAD
PRINCE GEORGES COUNTY, MARYLAND
BUILT CIRCA 1712

MEASURED & DRAWN
BY.
ALBERT P. ERB

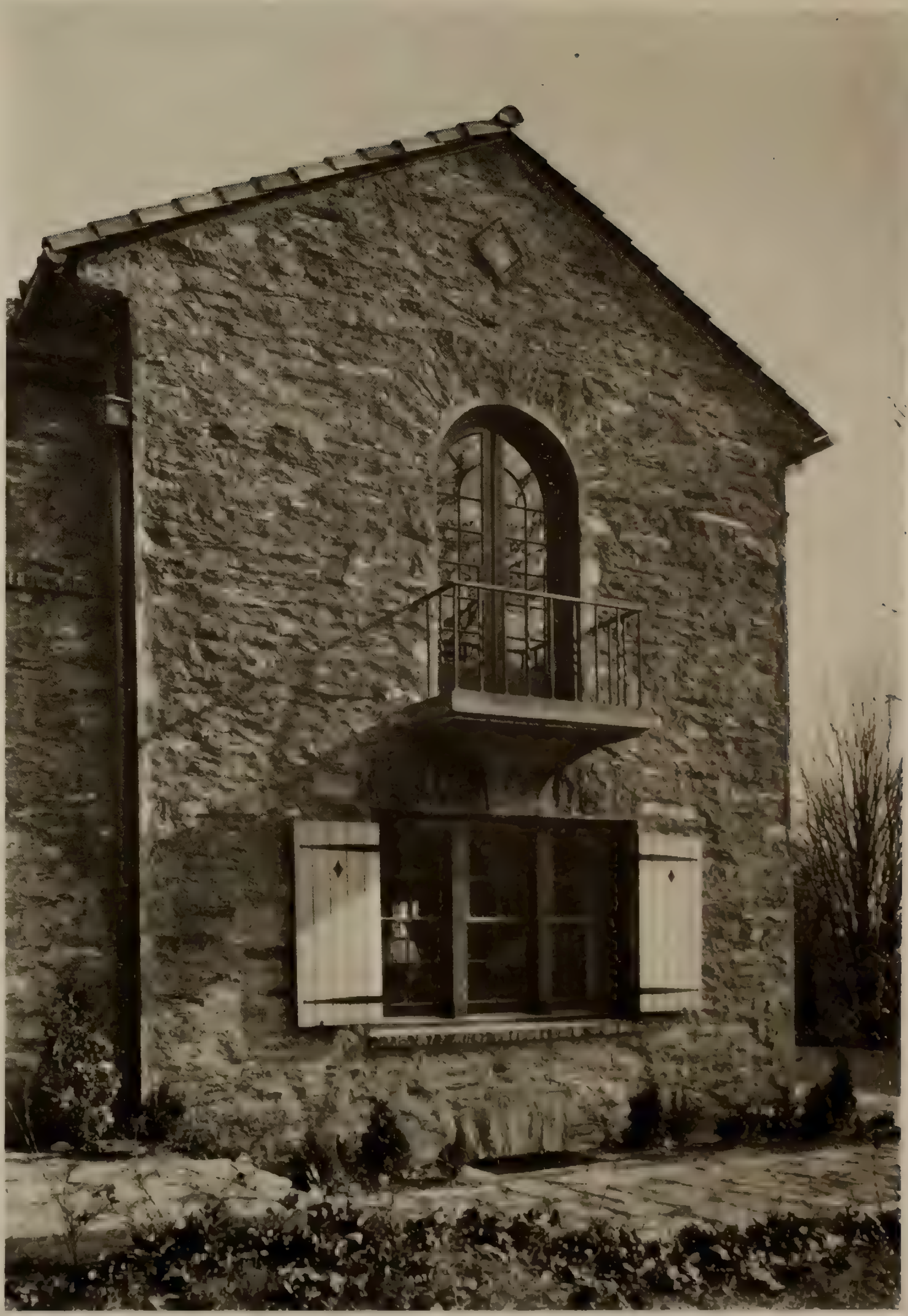


RESIDENCE, BRENTON G. WALLACE, ROSEMONT, PA.

Wallace & Warner, Architects.



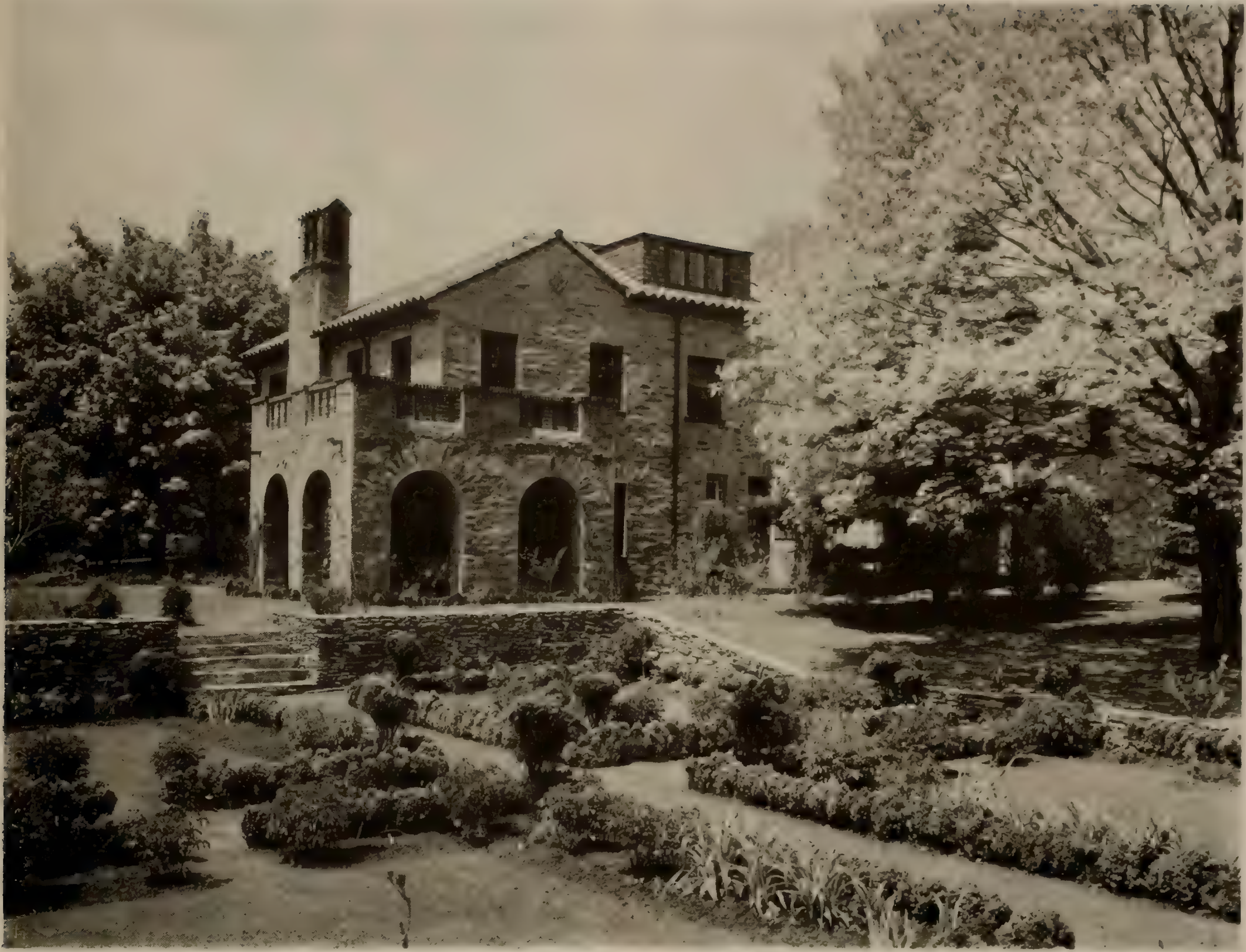
DETAIL OF ENTRANCE.



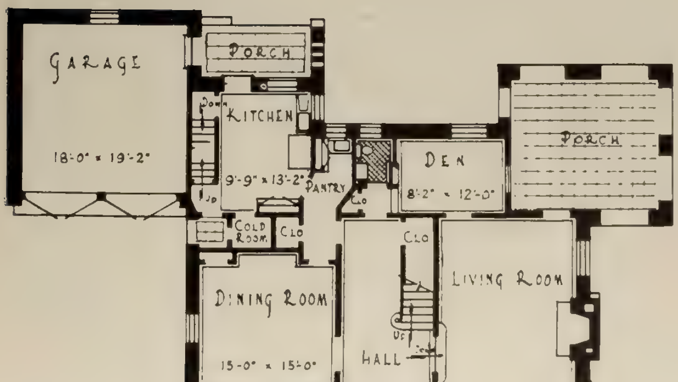
DETAIL.

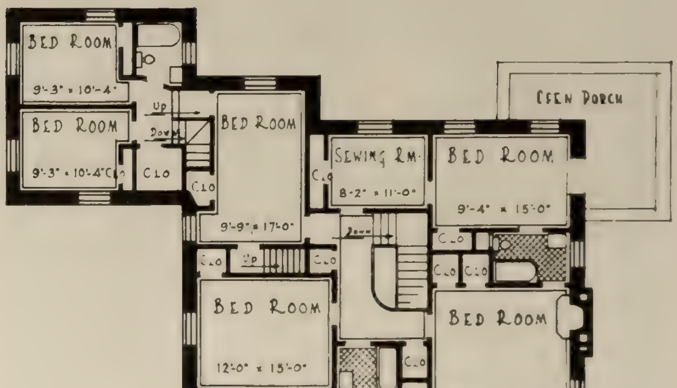
Wallace & Warner, Architects.

RESIDENCE, BRENTON G. WALLACE, ROSEMONT, PA.

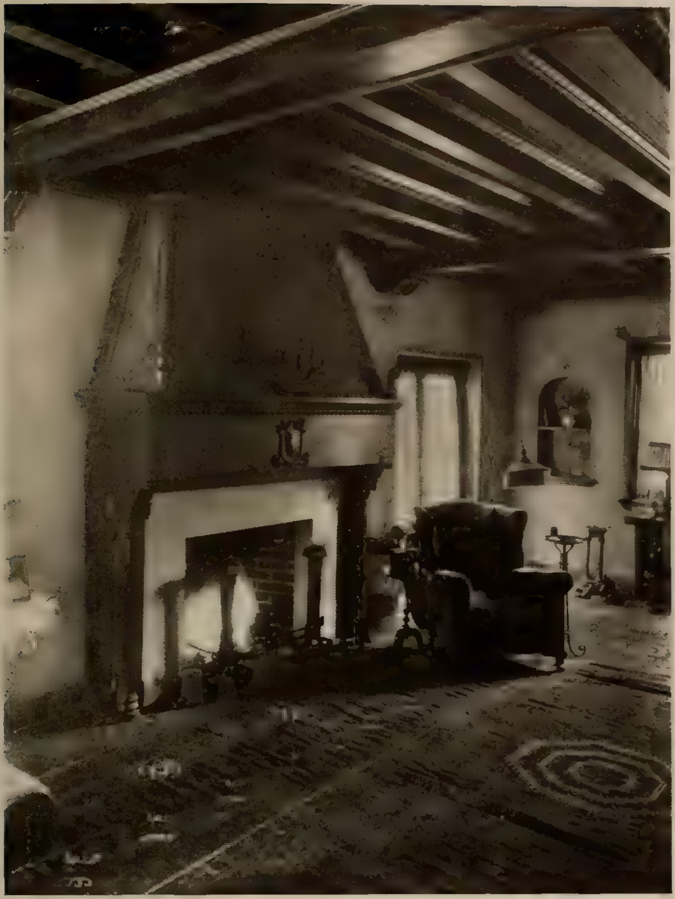


GARDEN SIDE.

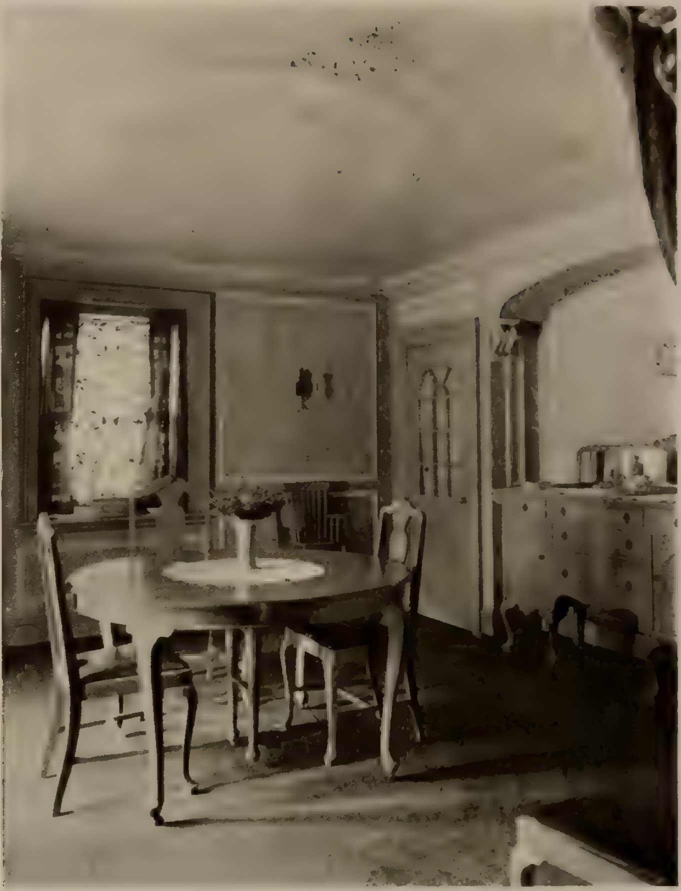




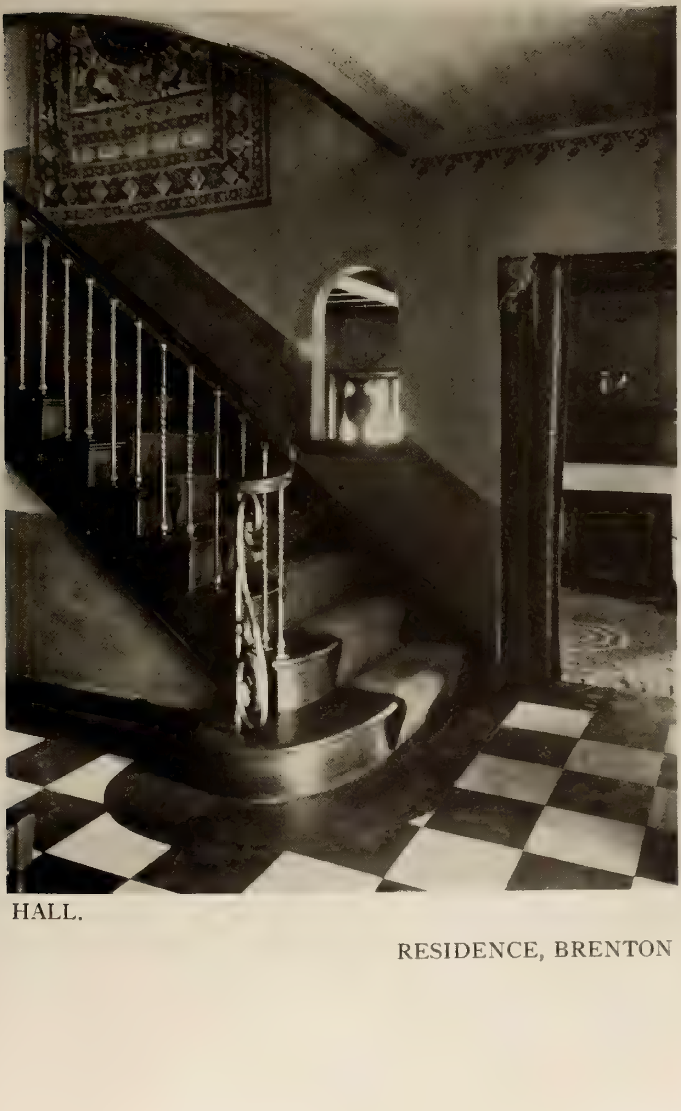
RESIDENCE, BRENTON G. WALLACE, ROSEMONT, PA. Wallace & Warner, Architects.



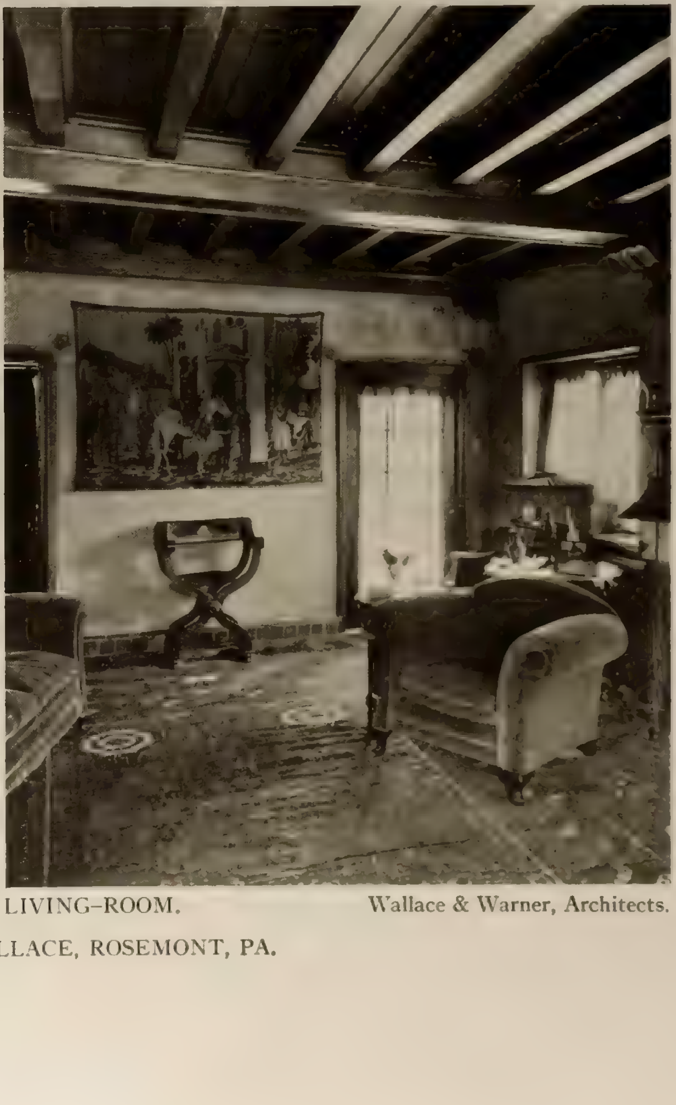
LIVING-ROOM.



DINING-ROOM.



HALL.



LIVING-ROOM. Wallace & Warner, Architects.

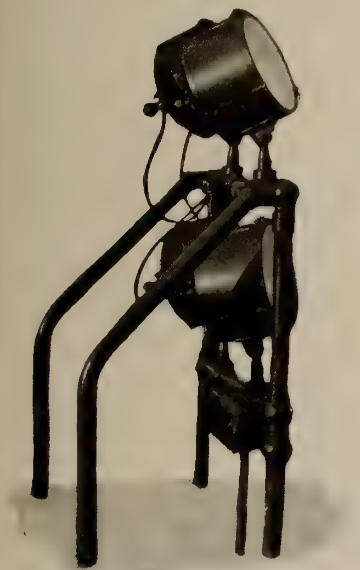
RESIDENCE, BRENTON G. WALLACE, ROSEMONT, PA.

Architecture from the Standpoint of Illumination

By Robert L. Zahour

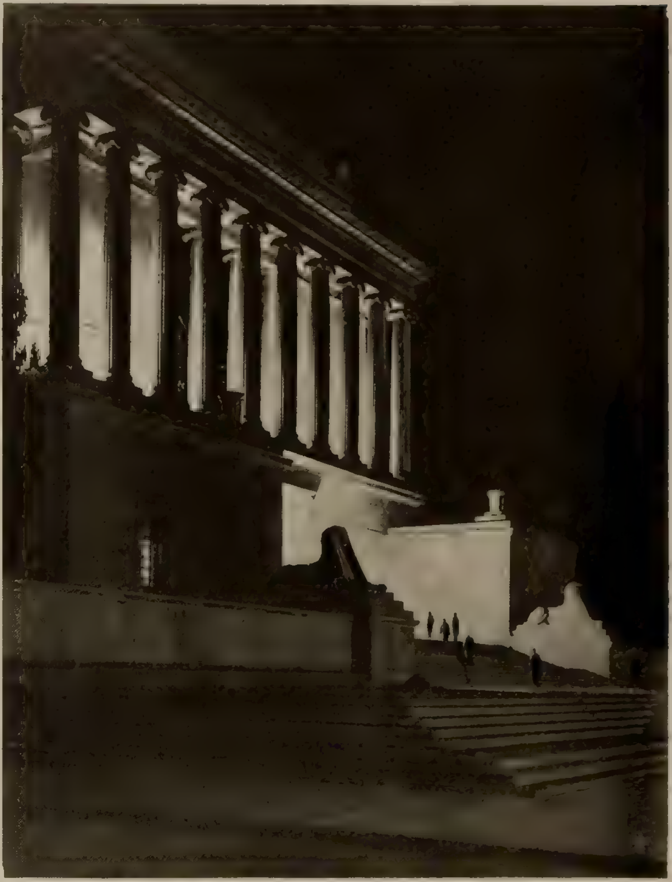
Illustrations by courtesy of The Westinghouse Lamp Company

AS far back as the early stages of civilization, the love for beauty and art has ever been a great inspiration to mankind. From the time of the Stone Age to the present day, man has been continuously striving to develop the expression of beauty and grandeur in architectural design, and as a result we have to-day the fundamentals of construction as in Gothic, Greek, and Roman architecture. It is expression and beauty that appeal to and inspire man; hence, from this standpoint, the architect must do more than build a utilitarian structure. He must beautify it—make it pleasant to look upon, then make it more visible or more happily useful by any means that presents it to the eye.

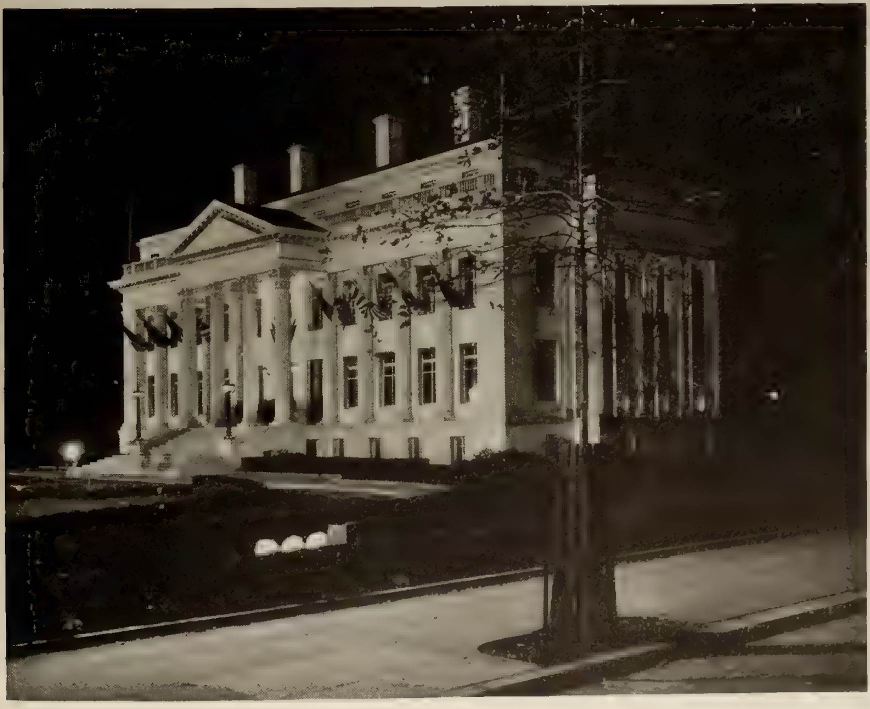


No. 4. Flood-lighting.

In order that the expressiveness of a piece of architectural work be well brought out, it is very important that the illumination be proper and adequate. A painting is only beautiful when it is well lighted and easily seen. The landscape is truly beautiful under the tender rays of the evening sun, or when color and shadow enhance the vision. So it is with architecture; the architect defeats his purpose of beauty, impressiveness, and inspiration, if he overlooks the lighting of his master art.



No. 2. Night illumination, Temple of Scottish Rite, Washington, D. C.



No. 1.

A vast amount of work has been done by some of our noted illuminating engineers along the lines of exterior flood-lighting, as well as the interior lighting for elaborate homes, municipal and memorial buildings, theatre and church auditoriums. As a result of this investigation, it was found that from a psychological standpoint no medium can rival light in bringing out the expression hidden in our modern architecture. Henceforth, the success of the architect's product finally depends upon lighting for its effectiveness.

The illuminating engineer has spent years of thorough study to learn some of the important characteristics of light, and it has been found that the degree of brightness, the tone, and color of light can be easily controlled. There has been created, among many of the noted architects, a desire to illuminate exterior portions of buildings at night, in order that the expressiveness of the architectural designs will stand out distinctively against the background of darkness. Hence the art of exterior flood-lighting was developed, utilizing projection searchlights concealed by shrubbery or the cornices of the building. Photograph No. 1 shows a typical flood-lighting scheme as applied to a memorial building of artistic architectural design. A properly placed and adjusted flood-lighting system, such as this one, will cover the building with a flood of evenly distributed illumination that will bring out, clear cut and in relief, the impressive features of the architecture.

Again, modified forms of flood-lighting schemes are ofttimes employed to bring out special architectural features of a building, as illustrated by Photograph No. 2. In this case the projectors are carefully concealed in the portico so as to illuminate the columns from within as well as the main entrance way.

Another form of flood-lighting for interior illumination is shown in Photograph No. 3. Night lighting is employed on the church windows from the exterior, enabling an enjoyment of sunset effects from within the church.

One prominently located manufacturer made an advertising signboard of his plant by means of flood-lighting. Spacious lawns surrounded the building on all sides, which permitted a clear and uninterrupted view from any direction of travel. The building rises 70 feet above the knoll on which it is situated and presents a total area of over 9000 square feet on each of its four sides. In addition to this, the building is of concrete, painted white. One can, therefore, readily imagine the striking monumental effect this structure has when flood-lighted.

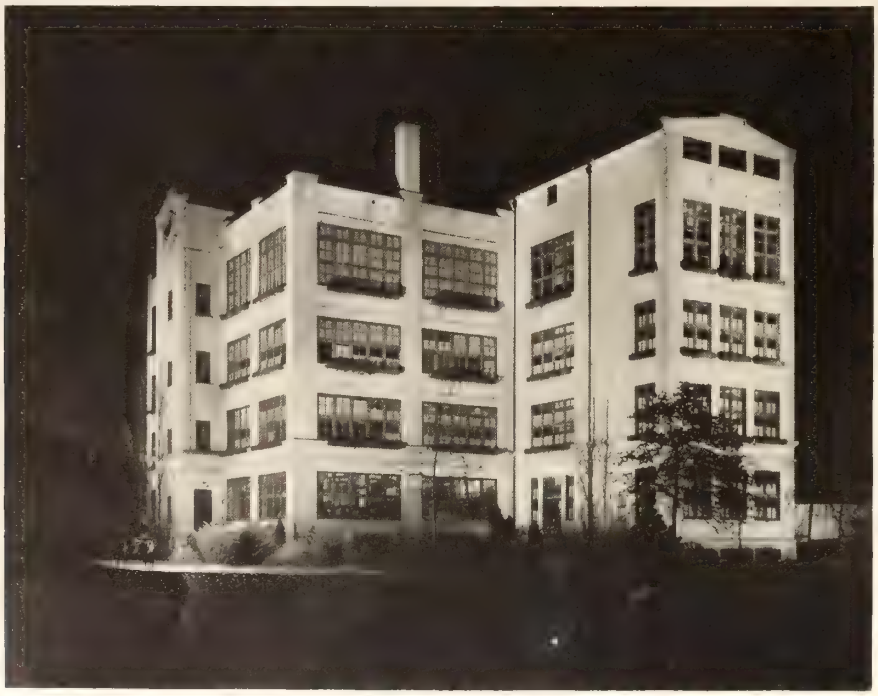
At nine different points located in a line around the building are installed the flood-lighting apparatus. The installation consists of thirty-two 500-watt Mazda flood-lighting lamps equipped with National X-ray reflectors. The projectors are on a mounting frame shown in Photograph No. 4. These frames are set in concrete under the sod and are made of two-inch pipe. The whole frame is painted with red lead for weather protection and finished in green, thus harmonizing with the lawn and shrubbery.

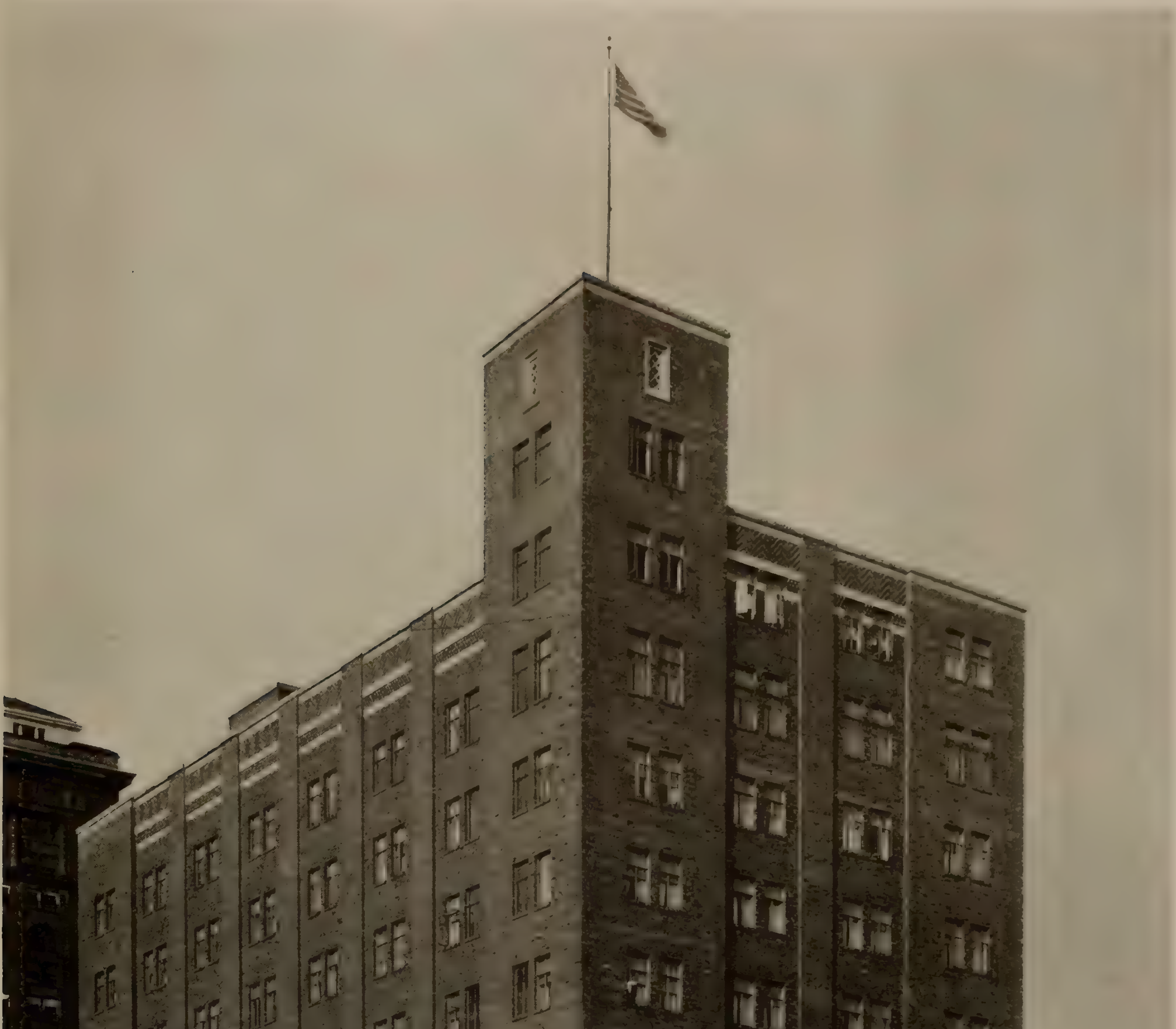
No. 3. Further use is expected of night illumination of church windows from the exterior, enabling enjoyment of sunset effects from within the church.

Lead-covered cable is used, through which all wire is laid underground to a weather-proof cut-out box mounted on each frame. Located on the service switchboard in the basement is an electrical time-switch by which the system is controlled automatically.

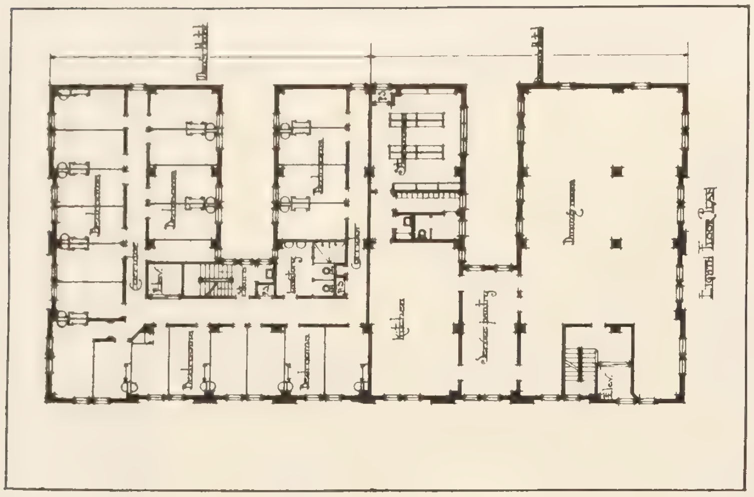
The illuminated night view shown in Photograph No. 5 is of two sides taken at a distance of about one hundred feet from the building. An average of 0.41 watts per square foot, or a total of 16,000 watts for the entire flood-lighting installation, is used.

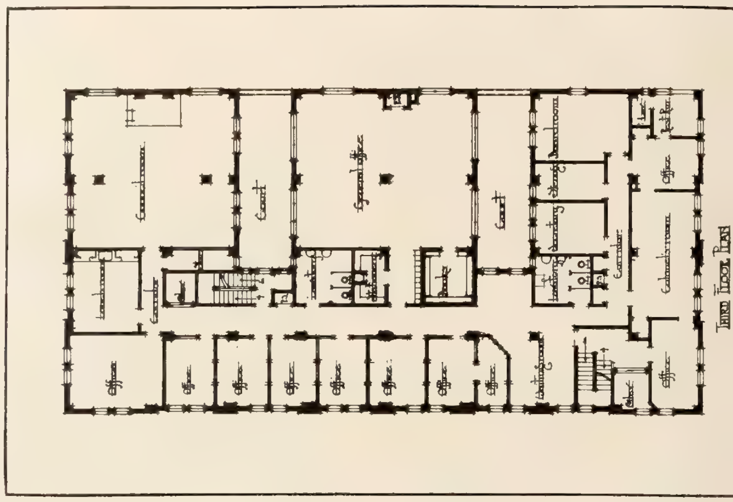
The gardener who has charge of the upkeep of the lawns, shrubbery, and trees on the surrounding grounds wipes out the reflectors and glass as part of his daily outside work. Hence the maintenance cost is very small, especially when, as is often the case, the electric power used at off-peak hours may be supplied at an especially low rate.

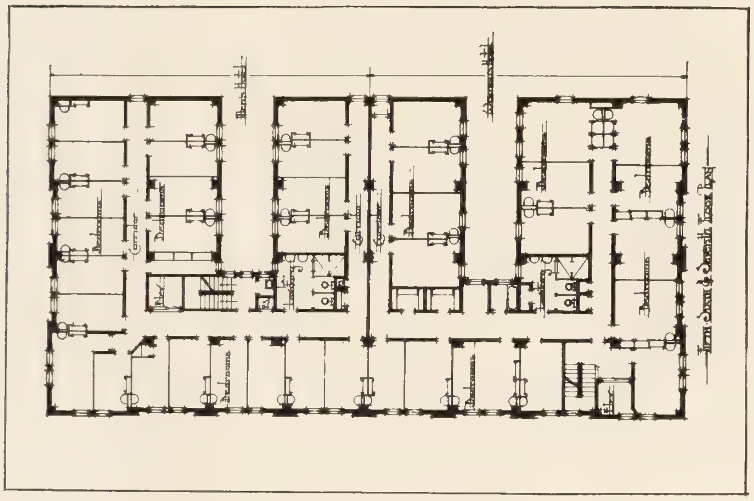

No. 5. Flood-lighting installation, Wheatena Company, Rahway, N. J.

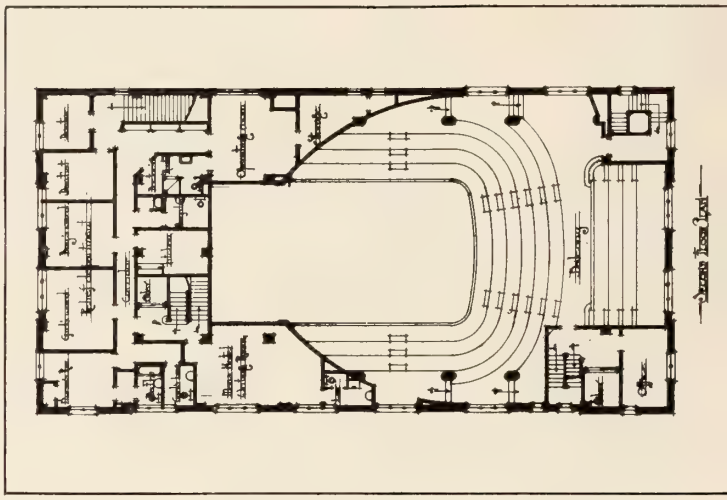


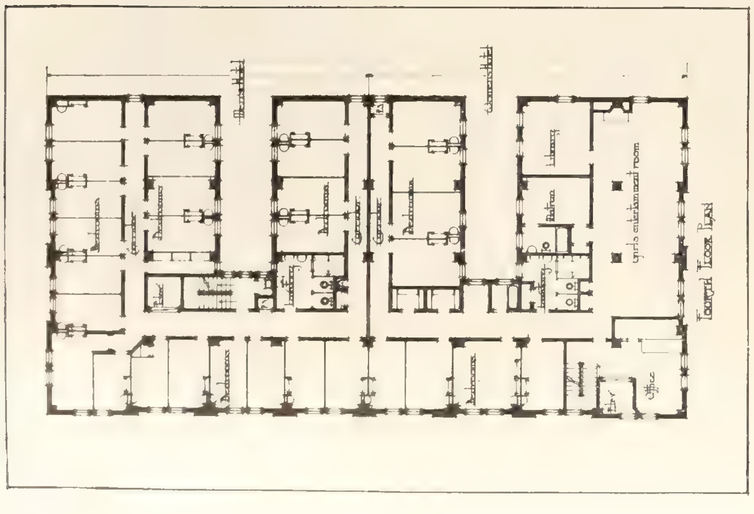
SECOND AVENUE FRONT, SALVATION ARMY HEADQUARTERS, PITTSBURGH, PA. Thomas Pringle, Architect.

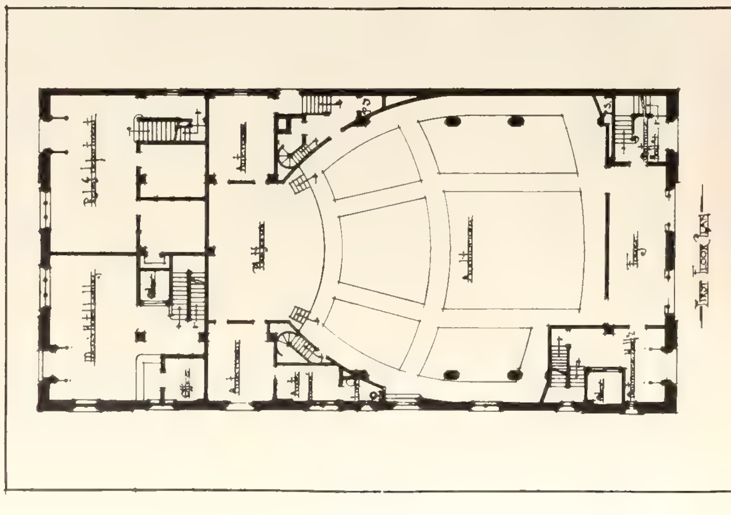

Eighth Floor Plan
Bedrooms
Corridor
Kitchen
Service pantry
Dining room
Elev.

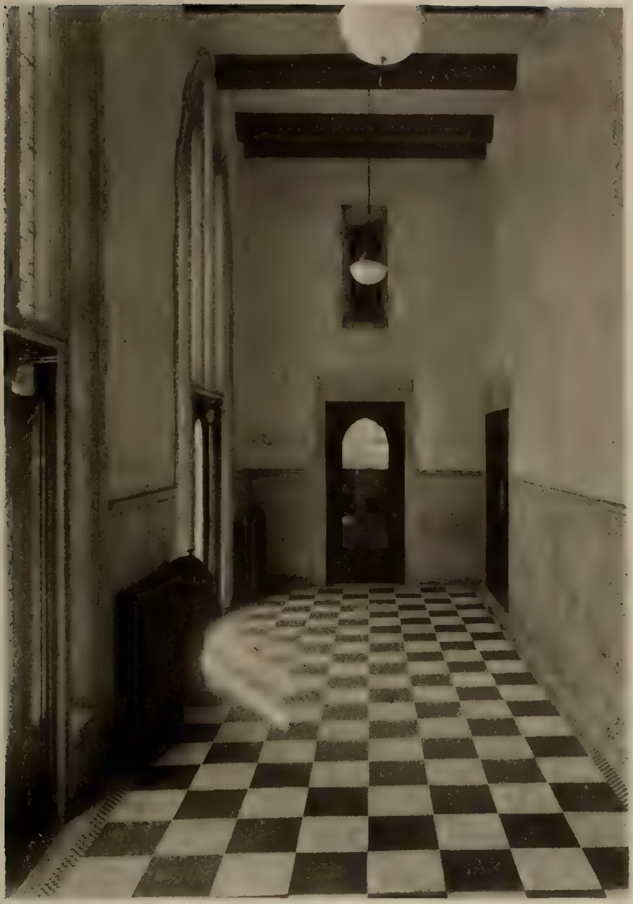

Third Floor Plan
General office
Court
Office
Corridor
Elev.

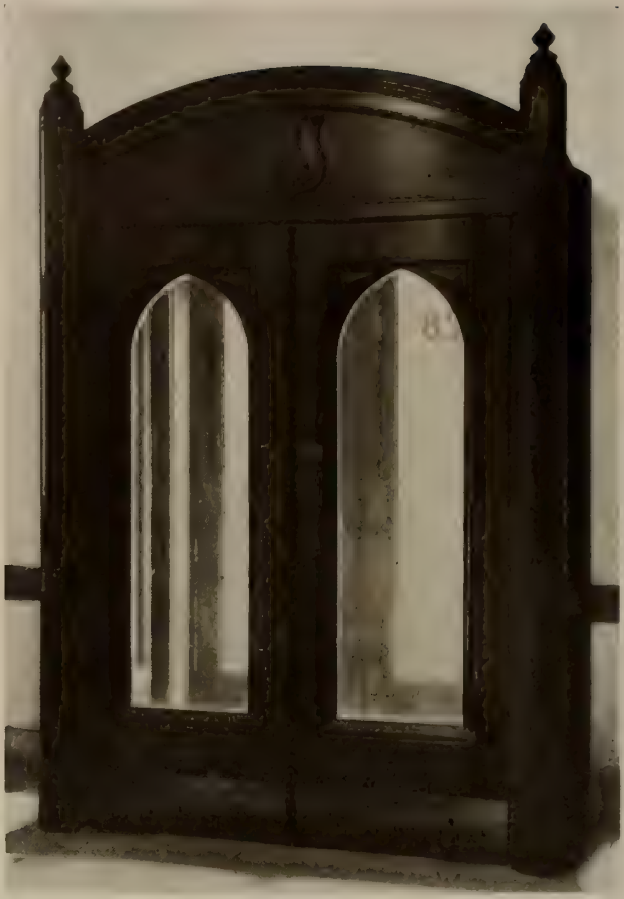

Fifth Sixth & Seventh Floor Plan
Bedrooms
Corridor
Elev.

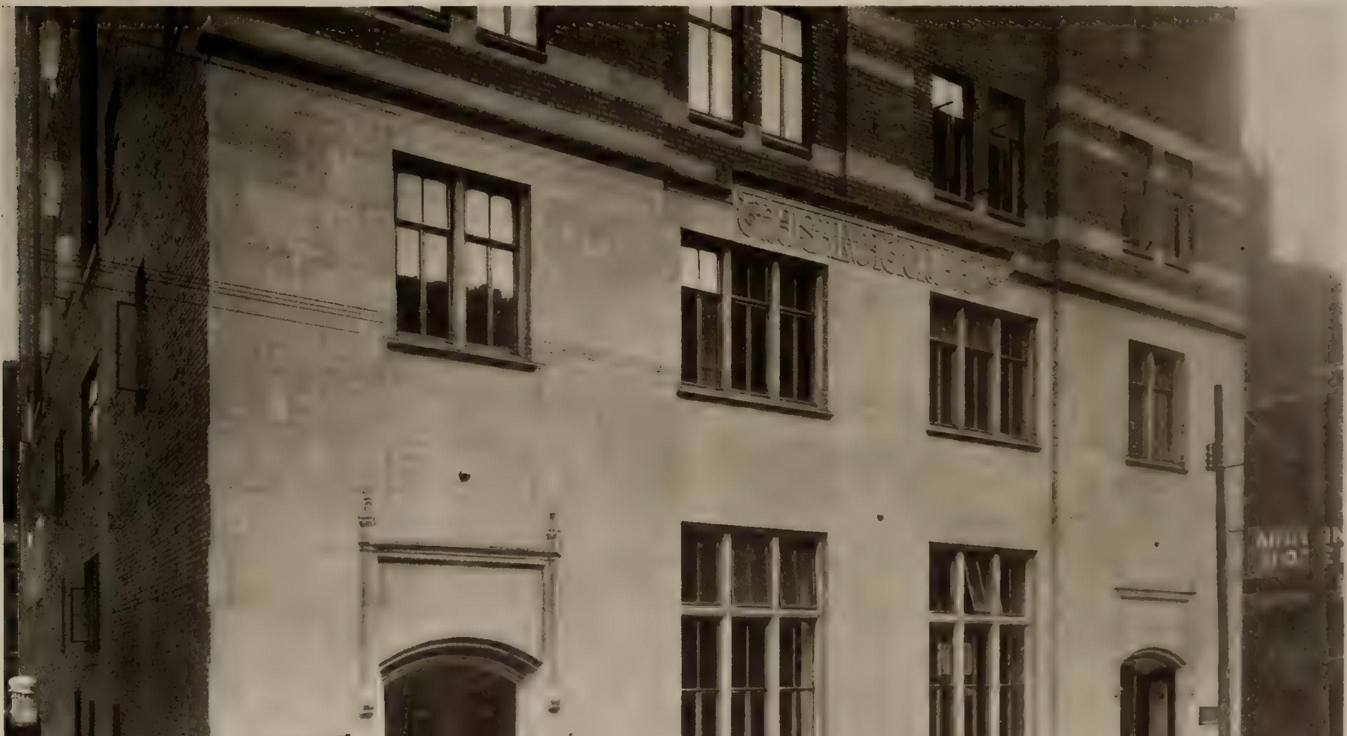

Second Floor Plan
Balcony
Corridor
Office


Fourth Floor Plan
Bedrooms
Corridor
Library
Girls entertainment room
Office
Elev.


First Floor Plan
Auditorium
Foyer
Platform
Office

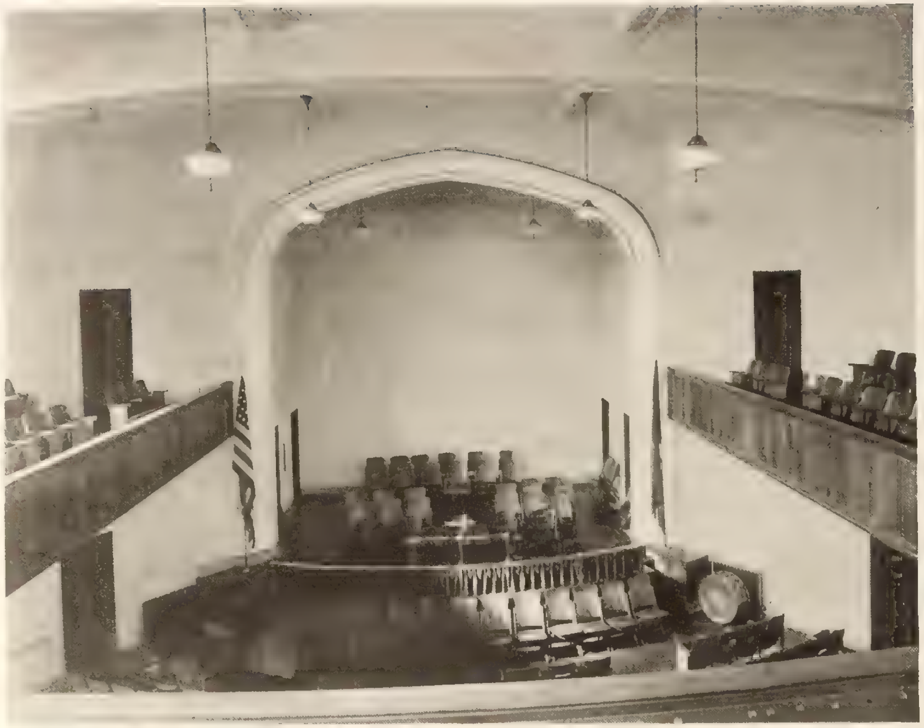

FOYER.


ENTRANCE VESTIBULES.

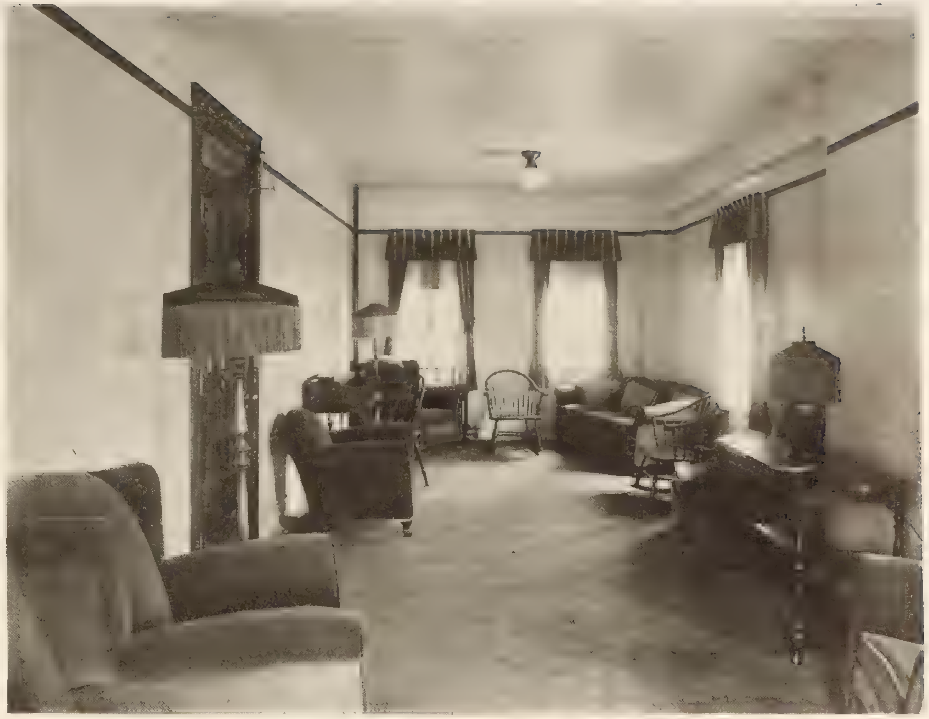

DETAIL AT THIRD AVENUE FRONT.

Thomas Pringle, Architect.

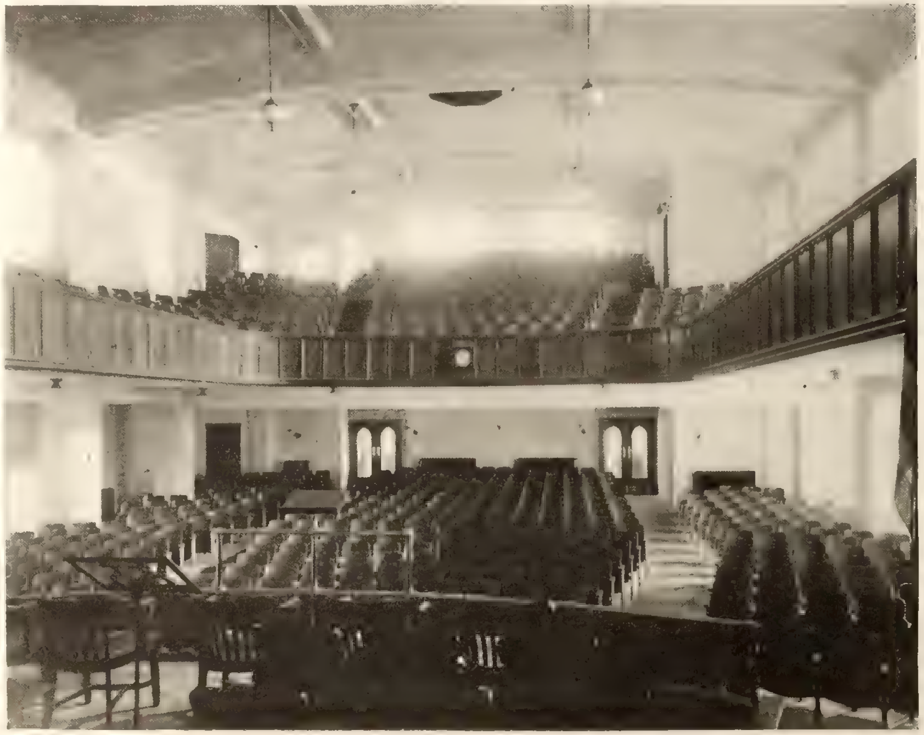
SALVATION ARMY HEADQUARTERS, PITTSBURGH, PA.



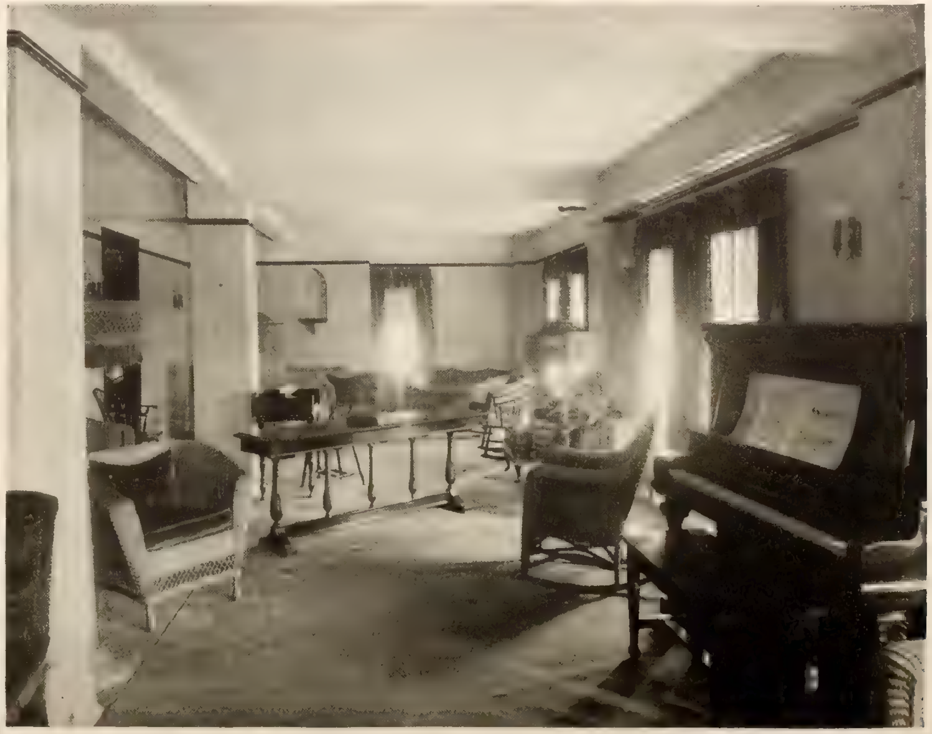
AUDITORIUM, TOWARD PLATFORM.



LOUNGING-ROOM, WOMEN'S HOTEL.

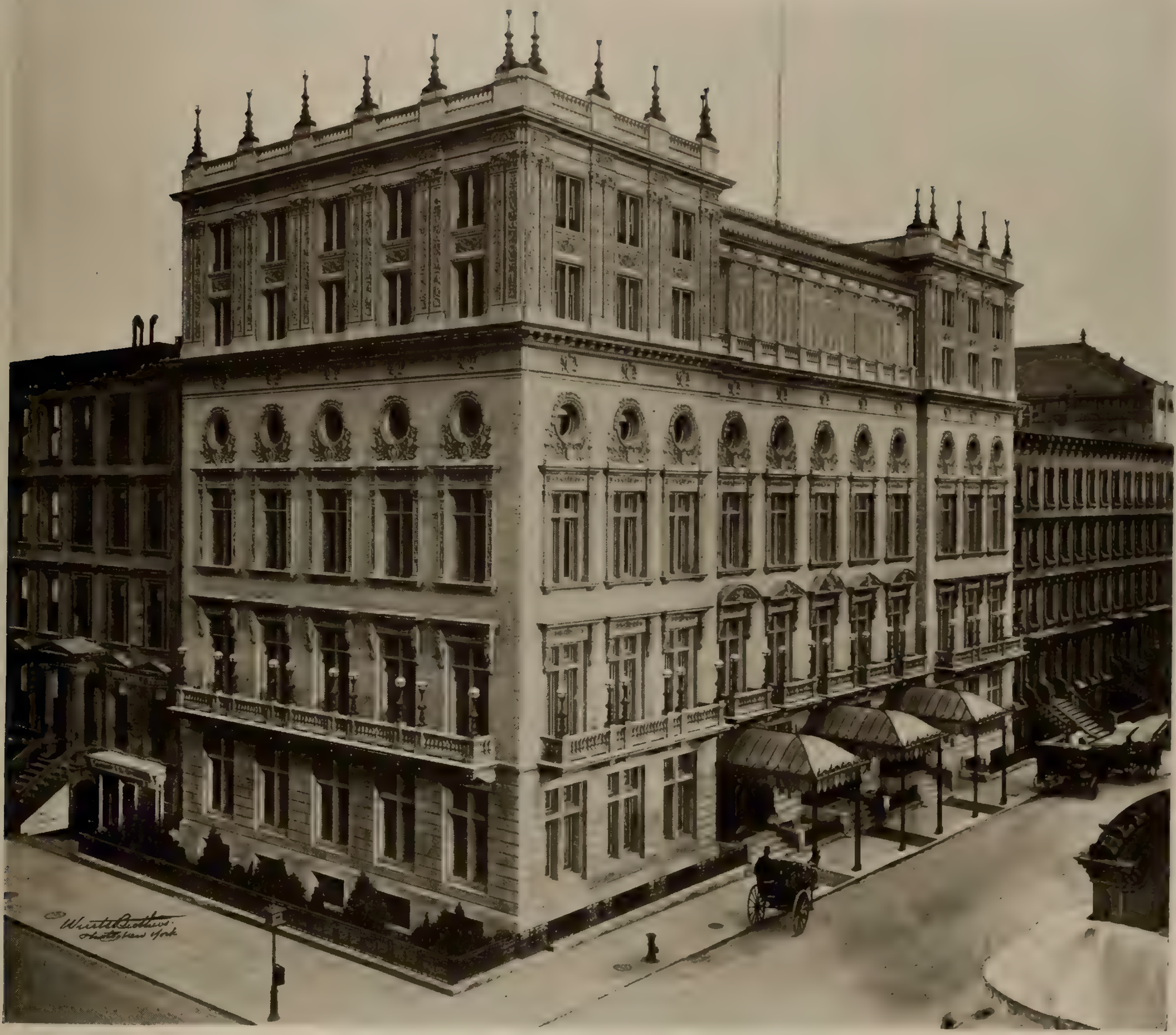


AUDITORIUM.



ENTERTAINMENT ROOM, WOMEN'S HOTEL.

Thomas Pringle, Architect.



DELMONICO BUILDING, 44TH STREET AND FIFTH AVENUE, NEW YORK CITY. RECENTLY DEMOLISHED.
James Brown Lord, Architect.
View taken just after the building's completion, showing the neighborhood conditions twenty-nine years ago.

On the Passing of Delmonico's, an Architectural Landmark

By F. S. Laurence

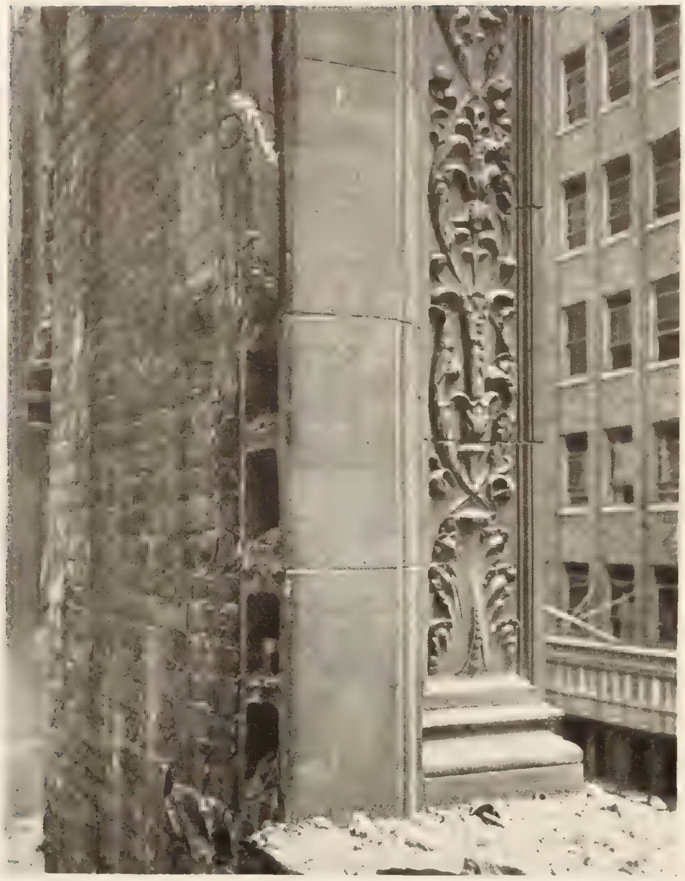
SEPTEMBER of this year has witnessed the passing of a building which for three decades has held a prominent place in the affections of the New York City public. Delmonico's is now no more.

All that remains as these lines are written are a few ragged fragments of the ground-floor walls, with here and there the lower portion of a steel column projecting above the broken masonry. A hideous gap yawns at the northeast corner of 44th Street and Fifth Avenue, once one of the show corners, architecturally, of the metropolis.

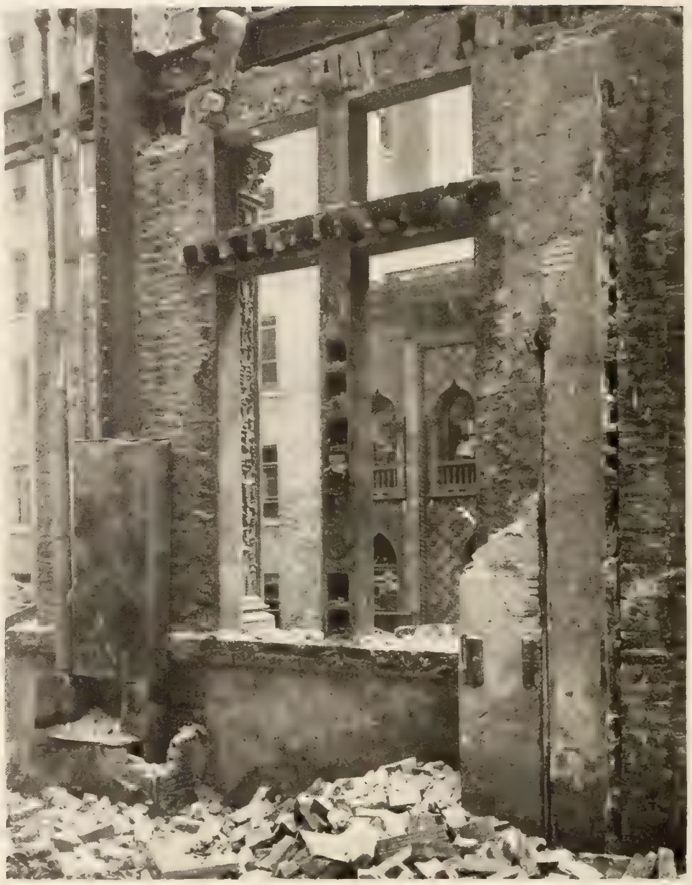
Once one of the show corners! What a world of reflection this statement conjures up—the changes which have taken place not only in the customs and social life of the city, but in the buildings which were the outward manifestation of these, typifying and perhaps symbolizing their essential significance, writing the story of their day, not, alas, for future generations of New Yorkers to read.

For these things we do not revere sufficiently to allow them to remain standing much more than a few years, twenty or thirty years at most. That is the apology for this article. Madison Square Presbyterian Church, Madison Square Garden, and now Delmonico's! Will it be the Century Club next, or what other example of our good earlier architecture which yet survives, hinting of a traditional culture and a civic background of more than yesterday's origin?

The Delmonico Building, it is true, owed its fame chiefly to the reputation of the establishment which it housed rather than to any outstanding merit of architectural design which



Close-up detail of terra-cotta window jambs, Delmonico Building, during demolition. The condition shown is typical of terra-cotta and brick work throughout.



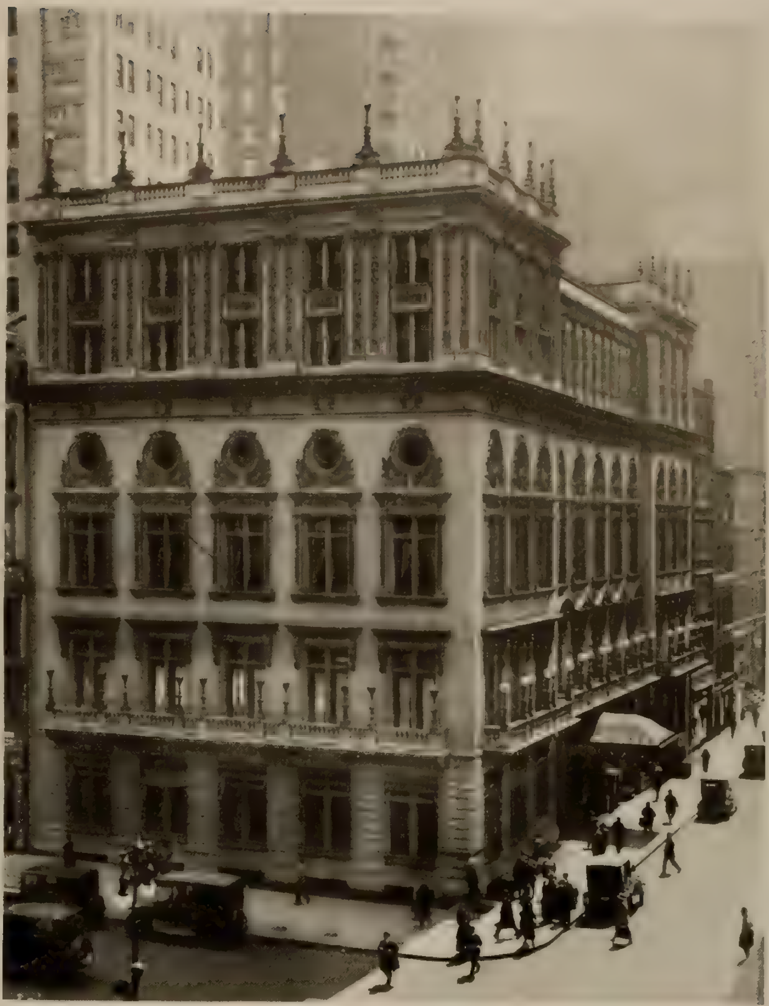
Detail of Delmonico Building, showing condition of steel and masonry opened up twenty-nine years after erection.

should perpetuate it from that standpoint alone. In this sense it is not to be classed with Madison Square Garden nor the Century Club, but in the same sense that these stood for certain aspects of New York City's culture its passing is to be lamented. Of an ornateness in detail which, like Madison Square Garden, is not commonly found in our recent building work, the general sense was one of dignified restraint and mellow, unostentatious richness, which was steadying to the mind in the surrounding scramble of towering, sky-piercing structures which have begun to shut in "The Avenue" during the past ten years. Perhaps its color was one explanation of this. The soft, deep-yellow buff of its brick and terra-cotta façade was as grateful to the sense as the permeating warmth of a glass of old wine in the far-off days when Governments were human.

It is interesting to compare the building's last aspect before the wreckers took hold with that which it must have presented in contrast to its immediate surroundings when first erected. The view published herewith, page 419, dating from the brownstone front and hansom cab era, vividly illustrates this and calls to mind youthful impressions of something wonderfully palatial and architecturally important. Not that we did not have at the time larger and more imposing buildings, especially in lower Manhattan. But in the heart of the district, as it was then, it must have seemed of outstanding architectural consequence.

Piece fron terra-cotta pilaster, Delmonico Building.

All these reflections, however, should be left properly to the shade of Ward McAllister, which may yet haunt the present ruins. It would be more proper, perhaps, to devote reminiscent eulogy to the architect, James Brown Lord, whose talent gave to the city one of its fine architectural landmarks. But Mr. Lord, too, has passed, and without having opportunity to survey the results of his designing in its structural aspect as these have been revealed in its taking down. Impelled by curiosity, the writer therefore braved the shower of falling bricks, plaster, steel girders, and what not, in order to note the condition of the steel and enclosing masonry material when this had been opened up sufficiently for the purpose. Some photographs are herewith presented showing conditions in this respect. Examination of the brickwork and terra-cotta and some of the adjacent steel work discloses a practically perfect state of preservation in all these, no deterioration having apparently occurred at any point, even in the projecting features of the cornice and pediment heads of windows on the 44th Street side, where the exposure was such as to favor this through penetration of water or general climatic action.



Delmonico Building, just prior to its demolition.

Perhaps this may have been due to careful maintenance, as in no case were there observed any joints in which the pointing cement was loose. Neither any settlement cracks. A notable condition was the prevalent absence of anchoring devices, the terra-cotta appearing to rest for its integrity chiefly upon a solid bedding in the brick walls. The construction no doubt followed generally the ordinary masonry methods pursued in similar applications of terra-cotta and brick in early Renaissance Italy, which are to-day structurally and ornamentally intact after the lapse of many hundreds of years. The brick used was a terra-cotta brick made in the same factory which supplied the terra-cotta, the two materials so produced, like some of the early Italian work, working together in an ensemble of color and texture which realized a most pleasing unity.

This aspect was one of its distinguishing notes and is one sometimes missed in the more recent joint uses of the same materials, where the effort has apparently been to sharply differentiate and disguise the identity of terra-cotta by giving it the appearance of some other material. The photograph shown of the terra-cotta piece from one of the pilasters suggests very strongly the frank recognition of medium in the character of modelled ornament, as there were no signs of erosion to explain the soft contours and freely broad modelling, which express so well the feeling of modelled clay.

Contemplating the passing of the Delmonico Building, one is left to speculate upon the waste represented in the discarding of so much fine detail. In the case of Madison Square Garden, it is commonly known that all the terra-cotta work is being carefully preserved, with the view to its use in a duplication of that structure, or part of it, on some other site, and it seems a pity that the correspondingly fine and rich terra-cotta detail of the Delmonico Building, in the perfect state of preservation in which it has been found, could not likewise have been carefully removed to grace some other structure where it would have been appropriate. Perhaps this is the case; the writer does not know, but is led to offer the observation because there is yet more than one instance of architectural work of about the same period still standing in New York, the ornamental detail of which, like that of the Delmonico Building, is worthy of preservation and re-employment elsewhere, even if no re-erection of the structure itself is warranted upon grounds of major importance or sentimental attachment.

Book Reviews

ELEMENTS OF FORM AND DESIGN IN CLASSIC ARCHITECTURE SHOWN IN EXTERIOR AND INTERIOR MOTIVES. Collated from Fine Buildings of All Times on One Hundred Plates. By ARTHUR STRATTON, Architect, Fellow of the Royal Institute of British Architects, Reader in Architecture in the University of London, Author of "The Life of Sir Christopher Wren," "The English Interior," etc. Charles Scribner's Sons, New York.

The purpose of this book is "to supply an index to known forms of classic building, and to present an analysis of elemental plans, sections, and elevations arranged in a manner for ready reference." In the author's preface he says: "Every architect should be familiar with the motives illustrated here, while to the student they are indispensable. As they are now, for the first time, conveniently arranged for reference and comparison, the task of teachers in making them known to the student should be rendered much less arduous than hitherto. This book is one of extraordinary usefulness and practical service, and will find a valued place in the schools as well as in the architect's library. It presents, in a series of chapters and plates, a review of the principles of form and design that has been much needed. The chapter headings give, better than anything we might say, the extraordinary scope and interest of the volume: Circular Plans, Circular and Rectangular Forms United, Square Plans, The Roman "D" or Tribune Plan, Semicircular and Elliptical Plan, Octagonal Plans, Rectangular Plans Disposed for Internal Effect, Internal Corridors, Vestibules, Vaulted Loggias and Covered Approaches, Internal Staircases, Pavilions, Loggias and Open Halls, Façades Not More Than Two Principal Storys in Height, Porticoes as Frontispieces and Approaches, External Steps and Staircases, Triumphal Arches, Gateways and Porches, Screens and Colonnades, Grottoes.

ART OUT-OF-DOORS. HINTS ON GOOD TASTE IN GARDENING. By MRS. SCHUYLER VAN RENSSELAER. New and enlarged edition. Charles Scribner's Sons, New York.

This has always been one of the most delightful books on the subject, and, with the pleasure it gives in the mere reading, you acquire a lot of "practical" information on a variety of garden topics. It is a good book for the architect, the landscape architect, and a good book for clients. It might be included in a list of nature books, for there are chapters on "The Beauty of Trees," "The Love of Nature." Many city dwellers will read with peculiar interest and appreciation the chapter on "A Neglected Asset —The Ailanthus Tree." The book is not too large to stick in your pocket for a little journey, and reading it along the way will help you to a better understanding of everything you see, and a wider interest in gardens in general, "The Home Grounds, Roads and Paths, Piazzas," etc.

Building in London and Paris

By David B. Emerson

ANY one who visited London two years ago, and returned there in July of this year, could not fail to see that London has a well-developed building boom; in fact, it is safe to say that at least ten times as much work is being done to-day as was being done in the summer of 1923. In all sections of the city the tourist will see construction work going on, from the earliest stages of demolition on to the giving the finishing touches to the completed buildings.

In addition to the work which is now under way, a large number of new buildings have been completed during the past two years. By far the busiest section of the city is undoubtedly in Regent Street, which is being practically rebuilt from Piccadilly Circus to Oxford Circus, and two new buildings are being erected between Pall Mall and Piccadilly Circus.

Being somewhat surprised at the amount of work going on in this street, I counted the number of building operations between Piccadilly Circus and Oxford Circus (a distance of about half a mile) and found that there were five buildings in the early stages of demolition and excavation, eight buildings in the more advanced stages of construction, and three just completed, but not yet occupied, all of which were large-sized buildings intended to be occupied as department stores and other large retail business establishments.

On Piccadilly Mr. Hastings's big apartment-house on the site of Devonshire House is progressing very rapidly, the steel frame being almost entirely completed. Another large apartment-house is going up directly behind it, on Berkeley Street, and the site has been cleared for another large apartment-house in the next block to Devonshire House on Piccadilly.

Some of the other districts in which considerable activity may be noticed, are down in the City, where a large office-building is being erected on the site of the Old Post-Office in Cheapside, and a large office-building is being built by the Royal Mail Steam Packet Company in Leadenhall Street. On the Strand five buildings are nearing completion and out in Kensington a department store, an apartment-house, and a large kinema, as the English call a moving-picture house, are some of the buildings being erected.

The general character of the work which is being done is excellent and resembles American work not a little, as it is all steel construction, with concrete floor-slabs. The greatest difference between the buildings being built in London and those which are being built in the United States is that the average height of the buildings in London is only five and six stories. One noticeable feature of their building methods which is quite a surprise to an American, especially one from New York, is that they do not give their steelwork a shop coat of paint, only giving it a field coat and in some cases omitting the painting entirely.

In Regent Street the new buildings are in many cases being erected right over the first story of the old buildings, and business is carried on as usual. The general architectural style of the new buildings in Regent Street is not particularly good, being a rather mediocre type of department-store French Renaissance, similar to that which we have had an overdose of here in the United States in the past.

The two most interesting buildings which have been completed recently in London are the Midland Bank Building in Piccadilly, by Sir E. L. Lutyens, and Liberty & Company's new building in Argyll Place, off Regent Street. The bank building adjoins St. James Church, Piccadilly, designed by Wren and harmonizes with it most charmingly, and when the bank building is mellowed a little by time they will blend together perfectly. The details are worked out in a most interesting manner, and at first sight one would believe them to be the typical seventeenth-century motifs used by Wren and his contemporaries, but on closer examination one discovers that, although the general outlines of the keys in the arches and the consoles under the pediments are the same as the early work, they are worked in a purely original manner, which is Mr. Lutyens's own and not copied from any one.

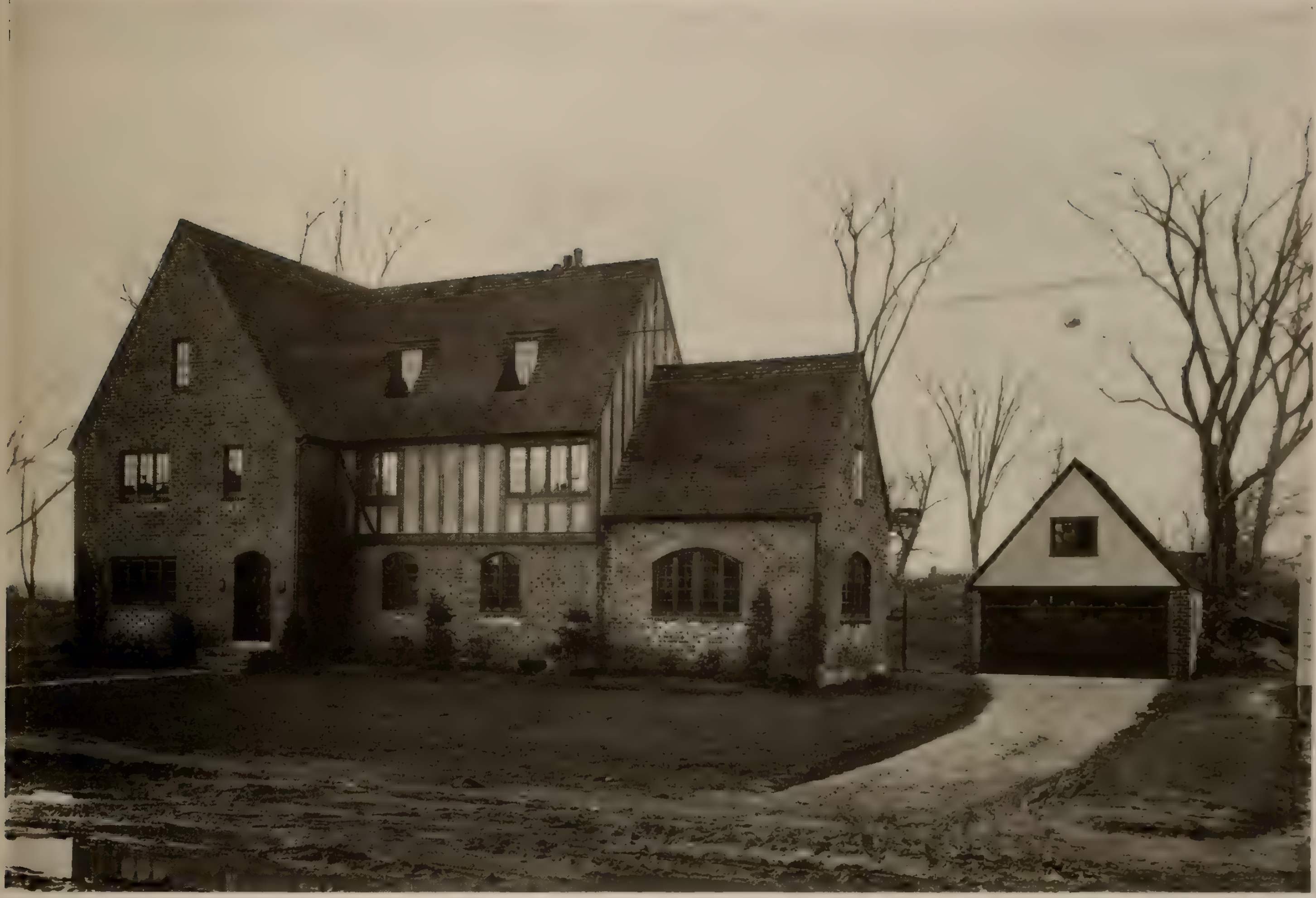
Liberty's building, which is quite well known in this country through their advertisements in the various magazines, is a most wonderful exhibition of craftsmanship, and viewed from the outside can perhaps be best described as a much-enlarged Tudor house, Chester-magnified, as it were, the timber-work both on the outside and the inside being of seasoned oak and teak taken from two old "three-decker" men of war, all mortised, trimmed, and pegged in the true old style. The carving is beautifully executed, and all of the details, lead-work, ironwork, glass, etc., are worked out in perfect harmony with the rest of the work.

A building like Liberty's could not have been erected in any of the larger cities in the United States, as the building codes would not permit such an extensive use of wood in the construction of a building to be used as a department store. Not only all of the exterior half-timber work, balconies, bay-windows, and large boards are of wood, but in the interior the columns around the open wells, the hammer-beam roofs, and the ceiling beams are all of timber. All of this goes toward making a very beautiful building, but one cannot but stop and think that with all of this exposed woodwork, and the building filled with highly combustible merchandise, what would be the result if a fire once got started there, especially during business hours?

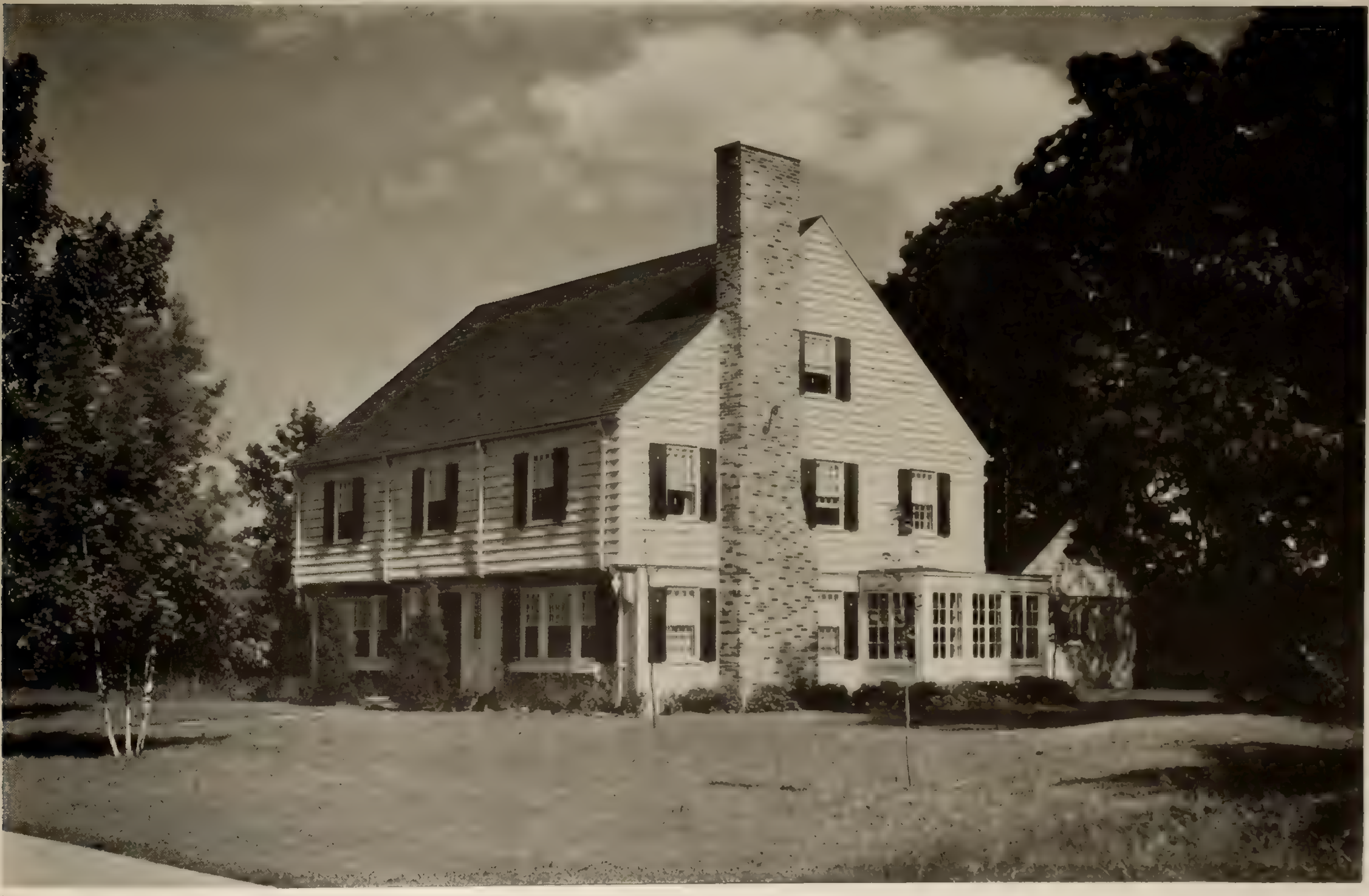
Conditions in Paris are unfortunately quite the reverse of what they are in London, as there is comparatively little building going on there, although there is more work in progress at the present time than there was in the summer of 1923. At that time I saw only one building under construction, the Magazins du Printemps, which was being rebuilt after having been practically destroyed by fire.

A number of new apartment-houses are being constructed at the present time in various sections of the city and one office-building is being built near the Bourse. Other work is being started, as an entire block of apartments is being demolished on the Boulevard des Italians and several old houses on the right bank of the Seine near the Pont Neuf are being torn down to make room for new buildings.

This small amount of building means very little for Paris, where the shortage of apartments is so great, for it is almost impossible to secure an apartment in the city at the present time, but with the franc at less than five cents, and no prospects of any increase, it is almost impossible to finance any great amount of building.

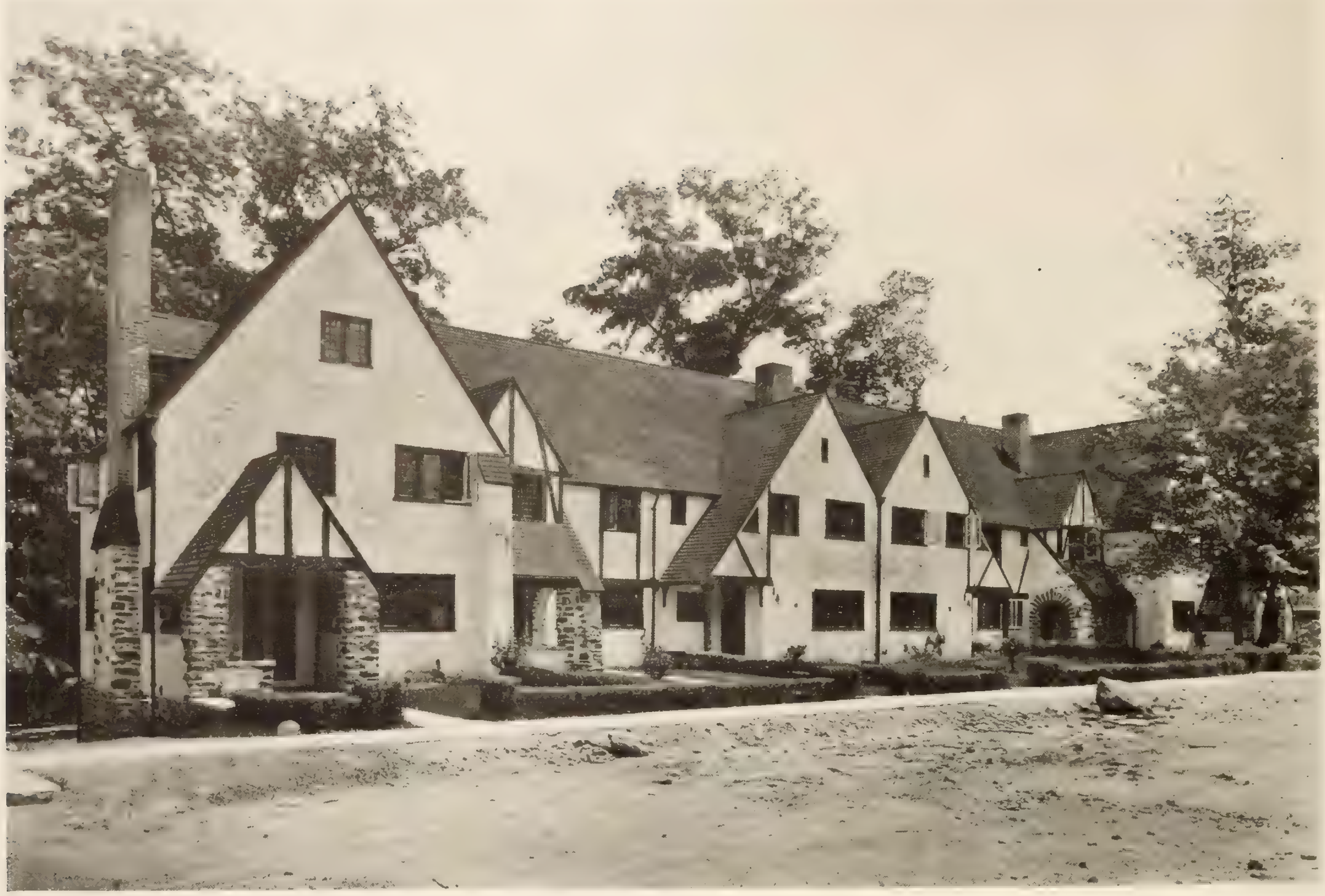


House at Larchmont, N. Y.

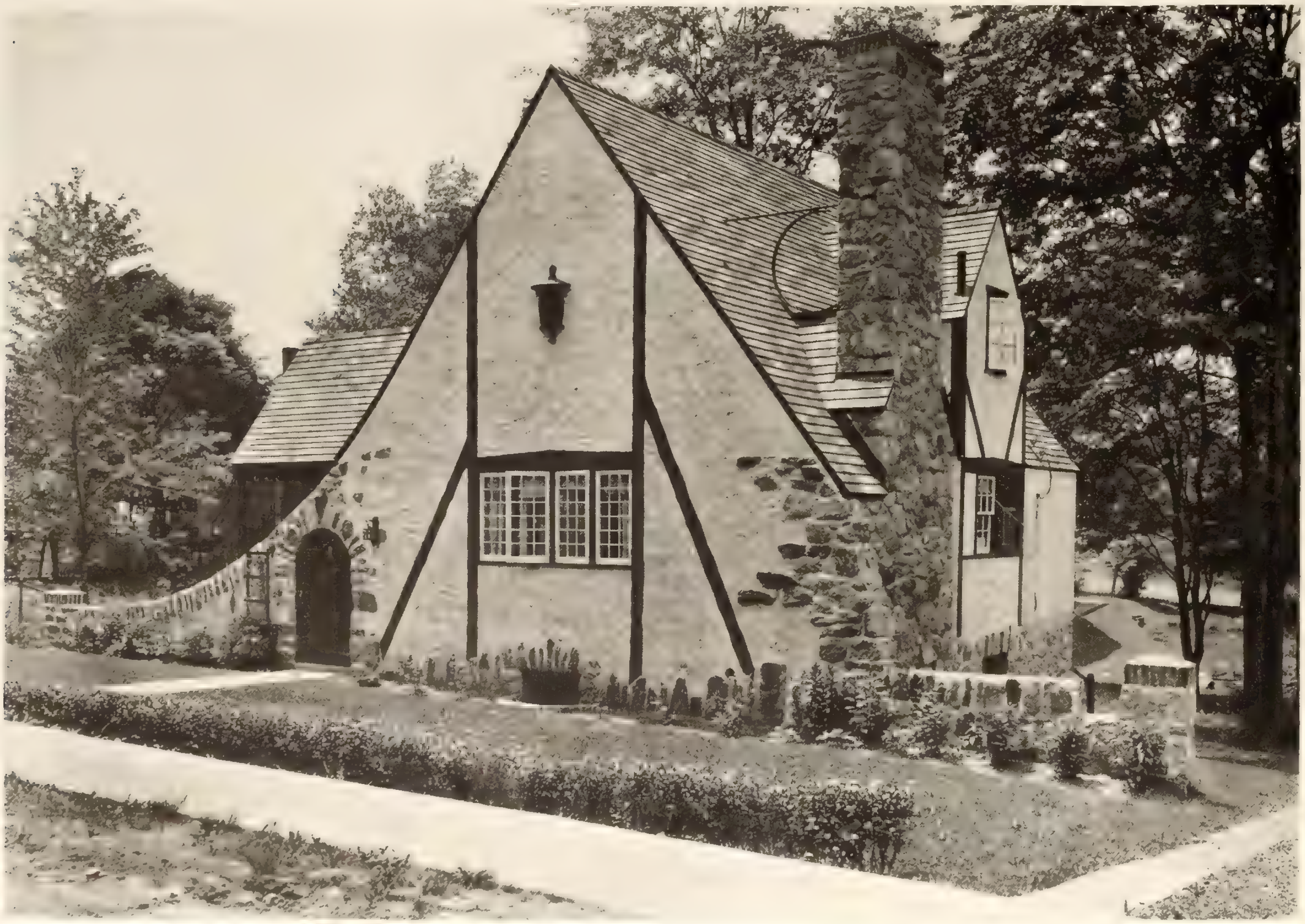


House at Springfield, Mass.

SMALL HOUSES IN SUBURBAN TOWNS.

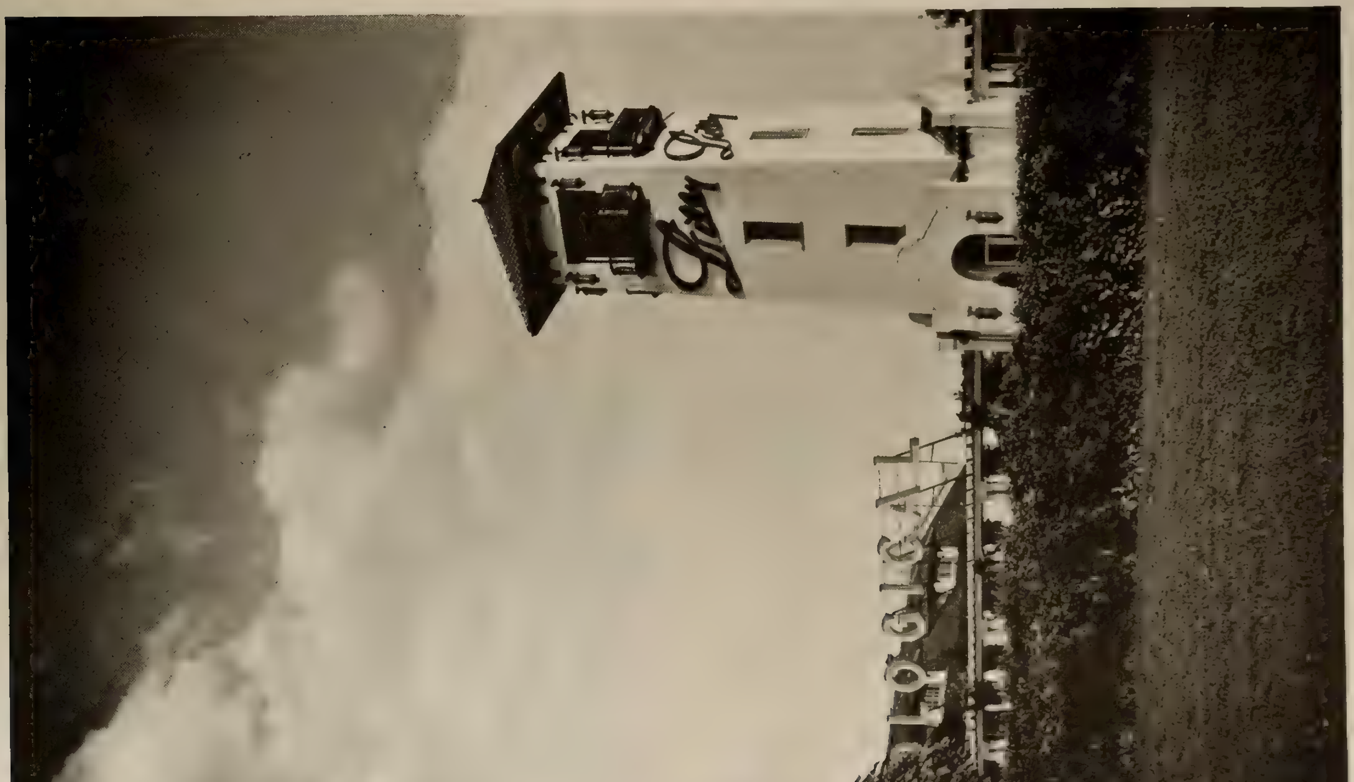


Houses at Pelham.

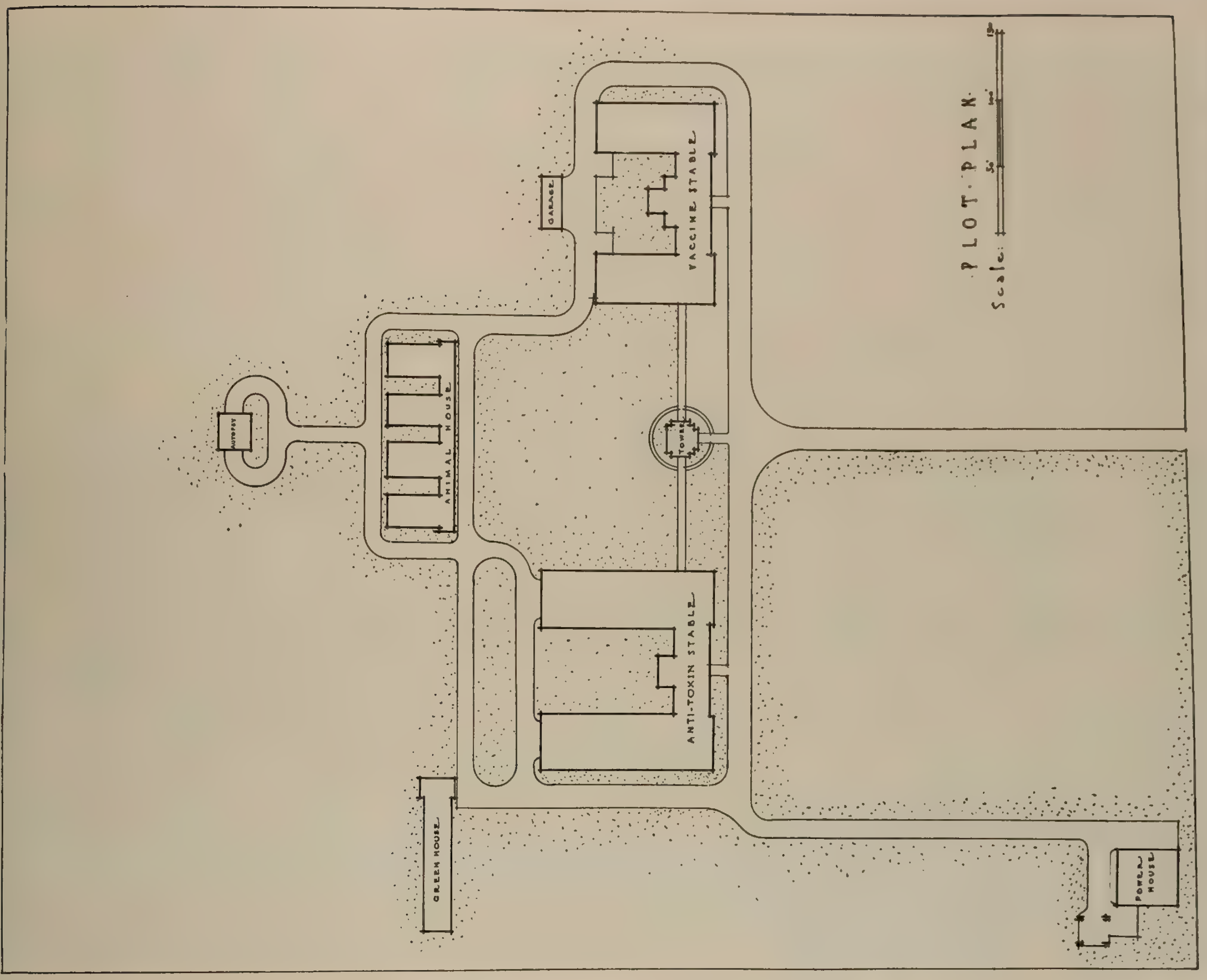


House at Pelham.

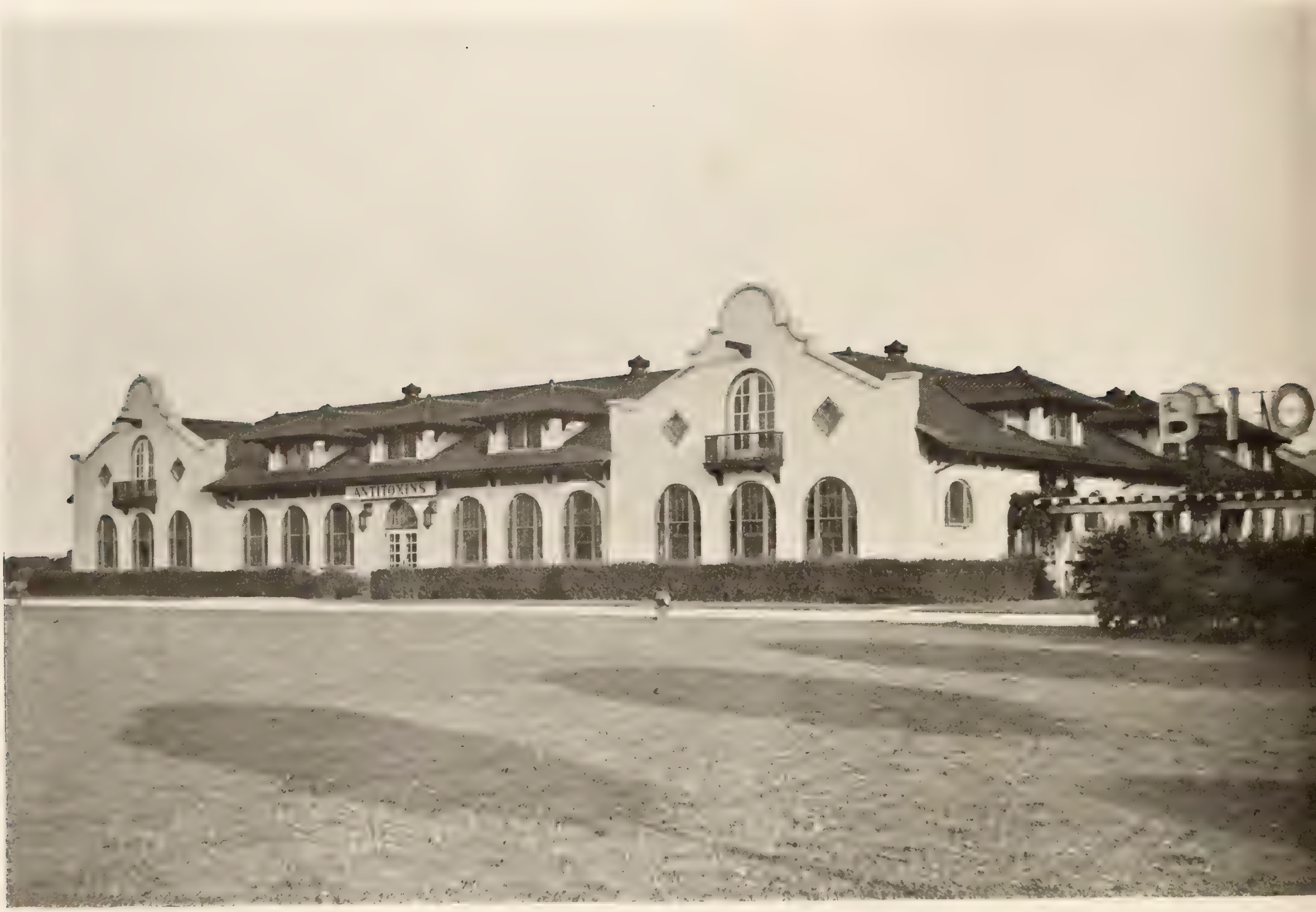
SMALL HOUSES IN SUBURBAN TOWNS.

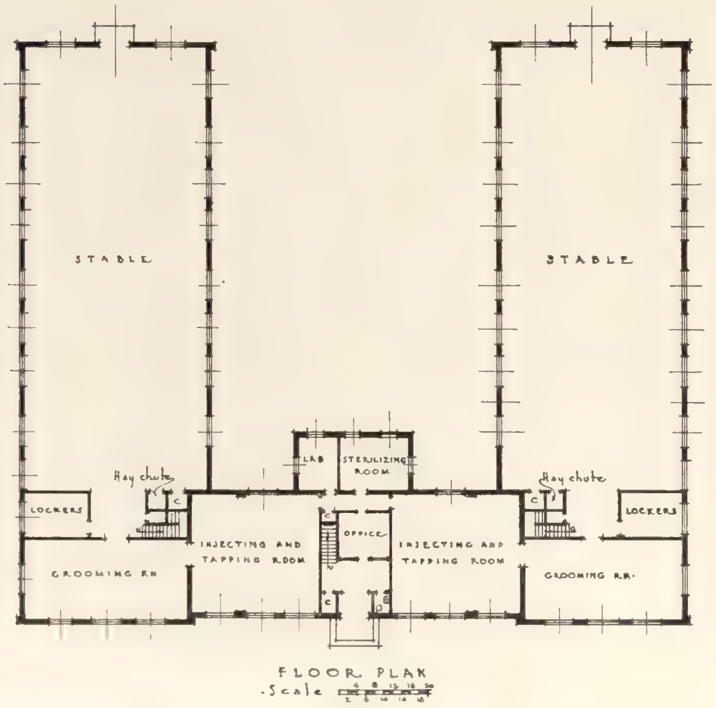


BIOLOGICAL PLANT, ELI LILLY CO., GREENFIELD, IND.



Robert Frost Daggett, Architect.





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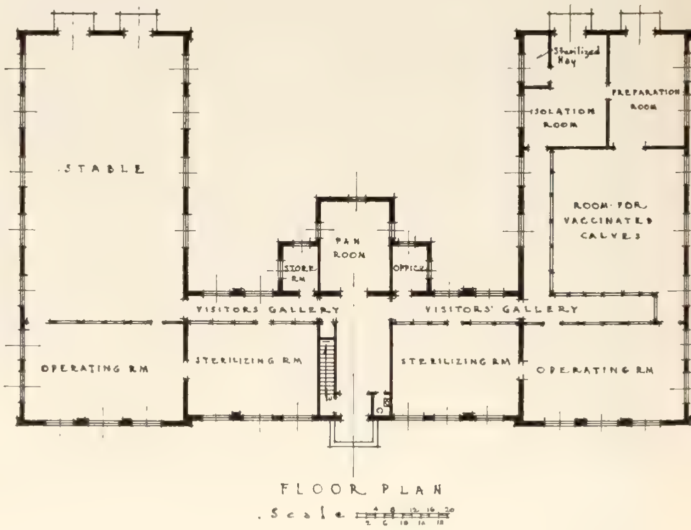

VACCINE STABLE

BIOLOGICAL PLANT, ELI LILLY CO., GREENFIELD, IND.

Robert Frost Daggett, Architec

The Effect of Gravity on Building Construction

By H. Vandervoort Walsh
Professor of Construction, School of Architecture, Columbia University

Article III

THE FOUR METHODS OF CONSTRUCTION INVENTED BY MAN

IN all of the thousands of years that man has been building on the earth he has invented only four distinct systems of construction. Of the origin of these systems we know nothing.

We guess that prehistoric man built with wood before he built with stone blocks, and so invented the skeleton system of construction first. But there are no wooden buildings left to prove it.

We have, however, a remarkable record of the high development of the carpenter's trade in the year 2000 B. C. in Egypt. It is a model of a carpenter-shop taken from the tomb of Mehenkwetre, chancellor and steward of the royal palace during the reign of Pharaoh Mentuhotep, about 2000 B. C. This model shows the interior of the shop with its equipment and craftsmen at work. Along two sides are carpenters with adzes squaring up heavy timbers. On another side are more who are rubbing down and smoothing the surface of the wood. In the middle is a post to which is lashed with rope a thick plank in an upright position. A black fellow—indeed all of the workers seem to be black—is sawing this plank from top to bottom into thin boards. Another worker near him is cutting mortises and tenons with a chisel which he strikes with a wooden mallet. This is such an extraordinary picture of the advanced condition of the carpenter's trade that we cannot be otherwise than convinced that many thousands of years had passed before the time when this model was built, for the trade to have reached this stage of development.

To find the traces of the earliest efforts of man to build with blocks is likewise impossible. We marvel at the primitive stone monuments left by a community of Neolithic men who lived in Coldrum in Kent, and have reckoned the date of their construction to be about four thousand years ago, but this is very modern for the Neolithic man, since, in other parts, his traces show evidence of his activities perhaps thirty thousand years ago. And even then man was by no means young.

But to make us realize how far back into the past must be the day when man learned to build with blocks, we have only to look at the great skill shown by the Egyptians of three thousand years ago in handling blocks of stone. We have one special record of the time when the chief architect and namesake of Pharaoh Amenhotep III had carved from the quarries in the red mountains and the sandstone hills of Adfu the 70-feet-high Colossi of Memnon. The writings show that eight special boats were built to bring them down the river to Thebes. Amenhotep enthusiastically commented at the time that they were wonderful for size and height, and that they would last as long as heaven. Such pictures make us stop and consider the question of how long before this time had man been learning the art, so wonderfully developed, at a date that seems to us remote beyond understanding.

Simple block construction, Temple of Luxor, Thebes.

A slightly advanced system of block building was devised by man when he discovered how to balance his blocks in an arch. There are some theories that this knowledge was hit upon by accident by the Babylonians, who were forced to use small building units such as bricks because of lack of stones big enough to span openings. However, this is only a theory. But we can follow the progress of this idea down through the ages and notice that it reached its full fruition in the cathedrals of the Middle Ages. This system of construction is really clever block building, involving the skill and knowledge of the mason concerning the best ways to balance them.

Another method of building which was carried to a very high state of development by the Romans is the cohesive system. This is but the art of the potter carried out on a large scale. It is concrete construction. The building is moulded as one cohesive mass. Domes are like inverted china bowls, vaults and arches like natural caves cut out of the rocks by the waters. Like the other systems of construction, no one knows where or how man discovered its principles.

Thus we have inherited from our ancestors four ways to build which we will sum up as follows:

1. Skeleton construction.
   A frame or skeleton of the building is constructed like a cage and is covered on the outside with material to protect from the weather. A tough and elastic material like wood or metal is needed to build this frame.
2. Simple block construction.
   Walls, piers, or columns are layed upon a foundation. Holes in the walls and the spaces between the columns are covered with horizontal stones called lintels. This system requires very closely spaced supports, since stone blocks make poor beams.
3. Balanced block construction.
   Walls and piers are erected to hold vaults or balanced stones which roof over the open spaces

within the building. Arches are used over the openings in the walls.

4. Cohesive construction.
   Walls, vaults, domes, and the like are formed with concrete poured into moulds. The building becomes one solid unit.

These systems of construction are usually mixed up in the same building, and we do not find many examples that are distinctly of one type.

Balanced block construction, Amiens Cathedral, France.

Of the skeleton construction of wood we have only suggestions of ancient methods here and there. Models, as we have previously mentioned, have been taken from Egyptian tombs that are suggestive of what was done. There are ruins of old stone monuments in many parts of the world which seem to be copies of wooden buildings. But after all they do not serve as clear examples. We do know, however, the traditions of the English half-timber farmhouse and, as our own frame buildings of wood are direct descendants, we can study them as types of this construction.

We can find many good examples of simple block construction, though, that are very old. There is one in particular which shows this method of building in its purest form. We refer to the tomb of Osiris at Abydos, excavated in 1912 and 1914 by Professor Naville. The interior columns are nothing more than square blocks set up on end, and the roof is built with blocks laid on top of them. Nearly every child that plays with blocks builds such a structure in miniature.

Cohesive construction, Baths of Caracalla, Rome.

When we look for examples of balanced block construction we naturally think of the great cathedrals of the Middle Ages that were erected in France, Germany, and England, but some of the earliest Roman bridges show us very wonderful applications of this principle of construction. There is one in particular, built about one thousand eight hundred years ago across the Tagus in the Spanish province of Cáceres. This bridge has six arches, the two central ones having spans of 100 feet and being raised above the river 180 feet. All of the blocks of the arches are laid without mortar. This bridge can truly be said to stand because of the skilful balancing of great blocks of stone in the arches, for no mortar binds the units together.

As for examples of cohesive construction, there are the ruins of the baths of Caracalla at Rome, Hadrian's Villa at Tivoli, and other Roman buildings of similar construction that have been stripped of their outer shell of decoration, leaving the massive concrete walls and vaults to tell the tale of how they were fashioned from concrete and small bricks.

Yet, although these four systems of construction are very old, and they have been employed in the erection of great buildings, no one knew how they stood up. Because of this ignorance, each building was an experiment in construction. There was no assurance that it would not fall down until it actually showed by standing that it would not.

In these days, when we can erect buildings 700 and 800 feet high and build over spans 250 feet wide without the least doubt concerning the stability of the structure, it is hard for us to appreciate the point of view of the old builders who hoped and prayed that their structures would not collapse. Even the Romans with their very practical minds were superstitious about the ability of their work to stand. When the keystone of their arches was dropped into place and the forms removed, they were always fearful of the results. The good-will of the gods was asked to keep the arch from thrusting out its support. We recall one story that illustrates this. In building the central arch of the Bridge of Alexander over a tributary of the Tigris at Zakhu, a village in Irak about 80 miles south of Lake Van, repeated attempts to make it hold were failures, until a virgin was buried alive above the keystone as a sacrifice to the gods.

Such stories reveal a point of view which is hard for us to understand, because we do know to-day that no supernatural powers are at work to pull down our building, but that there is a force, constant and regular, that drags all of the members of the structure downward. This force bends beams, creates the thrusts in arches, and causes the foundations of the building to skink. But our ability to even think of this force in so abstract a manner is due to a few men such as Copernicus, Da Vinci, Stevinus, Galileo, Huygens, and Newton.

Because of our knowledge of the whys and hows of

Skeleton construction, English half timber.

this force on a structure, we have advanced the frame structure of wood to the great frame buildings of steel, and the cohesive system from the clumsy and heavy structures of the Romans to the strong and light buildings of reinforced concrete and the wonderful flat tile domes invented by Gaustavino. We have discarded the simple block system and the balanced block construction and use it only in combination with the frame and cohesive, because such systems of building are clumsy and wasteful of materials. We are able to determine the necessary size for our structural parts without guessing, knowing that our building will not sink into the ground, topple over in the wind or cave in with its own load.

This is a tremendous change in construction, and to thoroughly understand the matter means the absorption of certain ideas that took many years to develop. For this reason we will begin our observations in the order in which these ideas came into light.

Steel Will Be Largely Used in Rebuilding Santa Barbara, According to Mayor Andrea

STEEL is to play a leading part in the rebuilding of Santa Barbara, where reconstruction activities have passed the financing and other preliminary stages, and are now well on the way toward tangible evidence of the determination of the people of Santa Barbara to erect a still more beautiful city on the ruins of the old.

After making a personal survey of the buildings wrecked by the quake, and after familiarizing himself with the reports of various groups of engineers, C. M. Andrea, mayor of Santa Barbara, has declared himself in favor of a municipal building ordinance requiring structural steel frames for all Class A buildings to be erected in the city in the future.

"Had the wrecked buildings of Santa Barbara been of steel frame construction, they would still be standing," said the mayor. "As an example of what steel frames will withstand, look at the Post Office. It is in the centre of the damaged zone; yet, due to steel, it stands virtually without injury. If I were drafting a new building ordinance, I would compel the use of steel frames for all buildings of the Class A type."

Those engaged in rebuilding Santa Barbara are not waiting, however, for the passing of an ordinance requiring the use of steel frames. In outlining his plans for a new hotel in Santa Barbara, Ole Hanson, former mayor of Seattle, and now a prominent realtor, stated that the building would be of structural steel construction since he was convinced that steel, because it possesses an elasticity lacking in other building materials, is best fitted to withstand future convulsions of the earth.

It is this factor of elasticity which makes steel construction the best for buildings in earthquake zones, according to J. D. Galloway, chairman of the National Committee on Earthquakes of the American Society of Civil Engineers.

"Elasticity is the keynote of sound construction in those districts which are subject to earthquakes," Mr. Galloway stated. "Even in the most severe quakes conceivable —quakes in which the structural steel might be called upon to bear stresses beyond the 60,000-pound limit of ultimate compression and ultimate shear—the columns would not fail, for the elasticity and cohesion of the steel would keep them intact, although they might become twisted and bent."

The present building ordinance of San Francisco requires steel frames for all structures of over eight stories. In his report to the American Society of Civil Engineers, based upon a thorough investigation of the effects of the earthquake upon various types of buildings in Santa Barbara, Mr. Galloway will recommend that this limit be greatly reduced.

Book Reviews.

ENGLISH GARDENS. By H. Avray Tipping. Profusely and Beautifully Illustrated from Photographs of Actual Gardens, and Including Some Reproductions of Old Drawings. Charles Scribner's Sons, New York.

We have been recently re-reading, with renewed pleasure and profit, the new edition of Mrs. Van Rensselaer's "Art Out-of-Doors." Of all the garden books dealing with American landscape, none has more charm of manner, or contains more helpful and well-considered suggestions. Mrs. Van Rensselaer has something to say about the traditional English garden, and refers to a number of the old writers who often combined their philosophy with a delightful appreciation of garden craft.

One might almost say that all England is a garden-land. To one who has travelled the roads in May-time, glimpsed, in passing, beyond the high walls that so often shut out the mere traveller, something of the intimacy and loveliness of the English home grounds, such a book as this will have something more than a mere professional appeal. It smacks of the long years of careful and thoughtful cultivation, of ordered and traditional planting, for beauty and for sentiment. Mr. Tipping has given us the widest possible variety of subject, from the simple cottage garden to that of the large estate, where wealth has, for many years, developed and maintained gardens of national reputation.

Some of us find a certain insistent formality, a lack of spontaneity and naturalness in many English gardens. And where but in England would you see the trees trimmed to look like peacocks of foliage, or dogs in full cry? Quaint, we might call these things, and let it go at that, but such things make us feel much as we do when we see a fine dog's ears trimmed in the name of style. A bad business for trees or dogs.

In looking over the illustrations of this book we are continually getting charming vistas and bits of garden loveliness. The Pergola Garden in Rose Time; Iris, Lupin, and Pansy; A Glade Leading to the Lawn and West Side of the House; The Outer Garden and its Jacobean Building; The Multitude Yews; Looking Across the Rose-Walk, etc., etc. Enticing titles to enticing views.

While it is a book about gardens, incidentally it is a book about architecture, for in many of the views the house, old or new as it may be, is shown.

Mr. Tipping gives us the English point of view in the following words, and we can agree with him pretty generally:

"The subject is the more worthy of attention from our being able to claim that the English of to-day hold the first place in the world as the producers and maintainers of the 'Garden of Pleasure.' We complain of our climate. Yet, from its comparative equability of temperature, with frequent changes within a limited range, and from its local varieties of site, soil, and climate, it is, almost beyond any other, adapted for varied gardening, for the forming of grounds of every type, and for the cultivation of species in the greatest number. Full advantage is taken of these favourable conditions. We like our gardens, we devote our attention to them, we intelligently choose the forms and the plants that Nature demands for a special site, or we cajole her into taking under her wing our special favourites. And all this we do in a way and to an extent not so fully reached by any other community. The French may be more apt in propagation and in culture, especially of fruit and vegetables; the Dutch hold the record for bulb production; the Germans continue to be the most careful seed growers; the Americans can spend more in great layouts and ambitious schemes; the Italians have a more splendid past; but for the efficient development and combination of the manifold pleasure aspects which horticulture now presents, our country offers the best field, while our taste and our learning make us keen and successful tillers therein."

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STUDIOS
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Designs and estimates furnished for gardens and garden ornaments.

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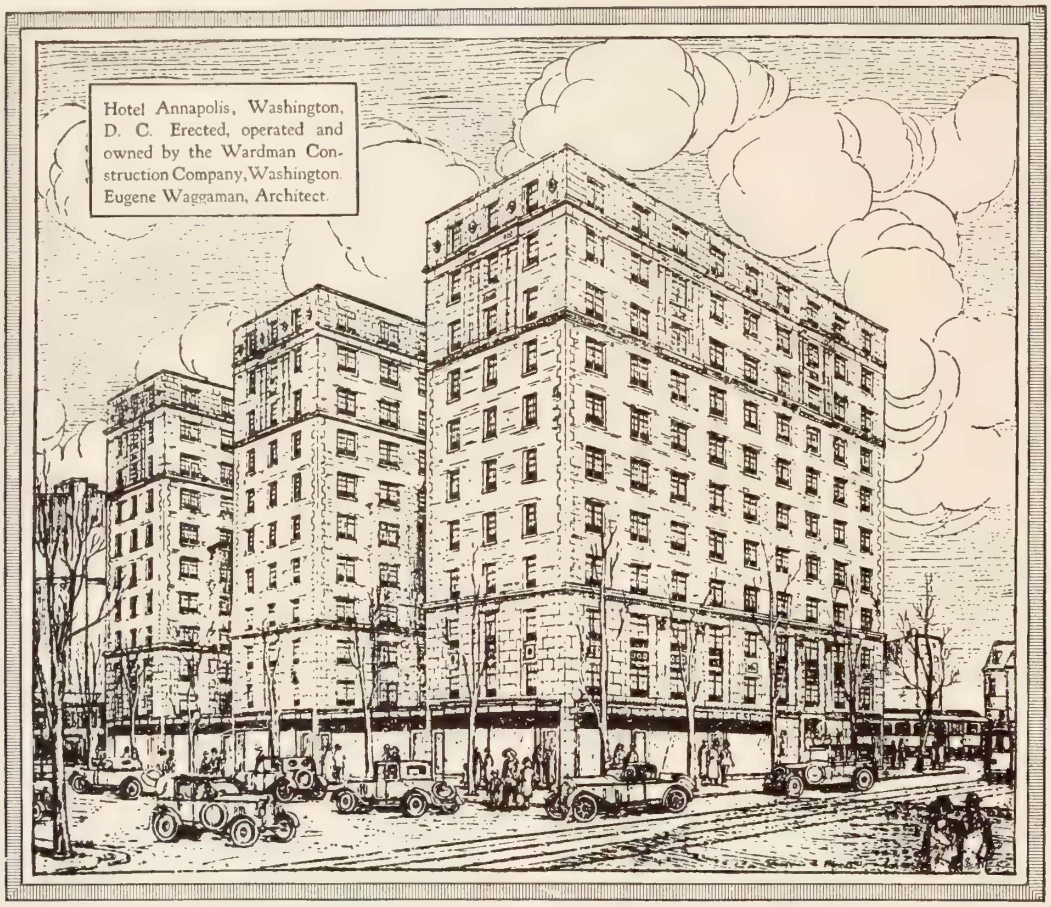

Hotel Annapolis, Washington, D. C. Erected, operated and owned by the Wardman Construction Company, Washington. Eugene Waggaman, Architect.

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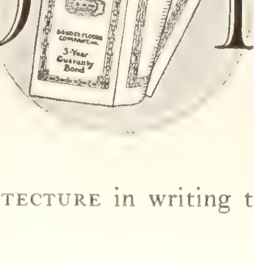

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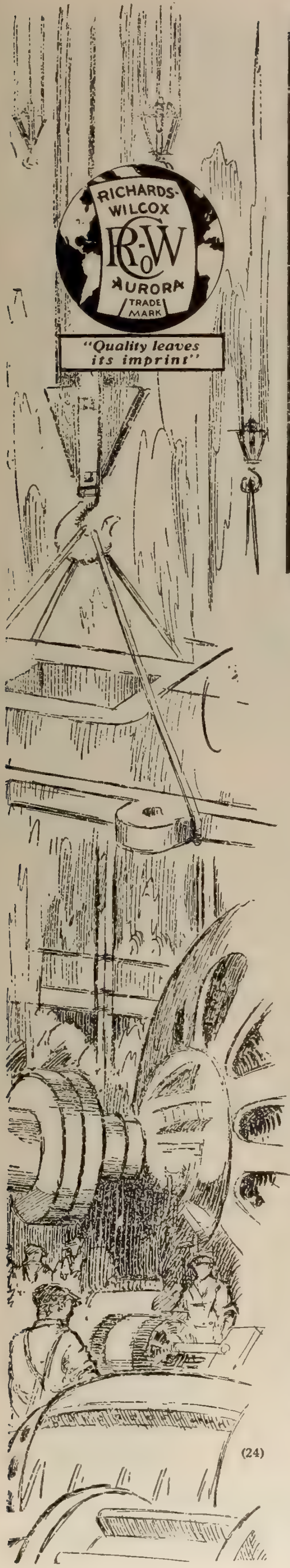

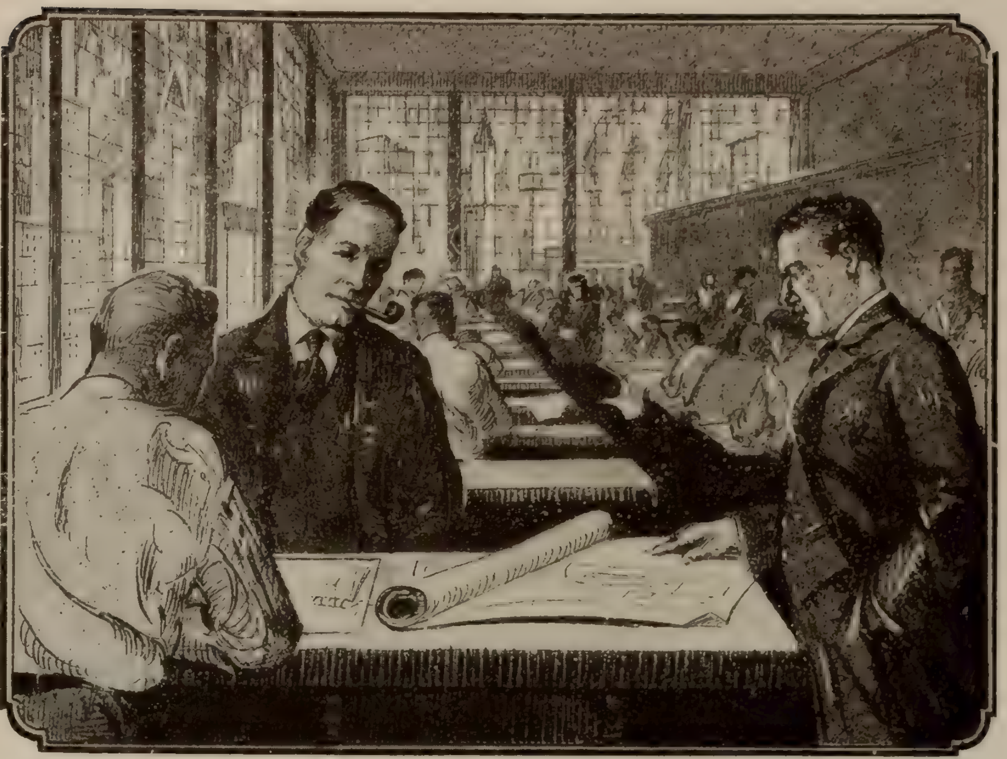

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Richards-Wilcox Hardware is designed to meet modern requirements

ARCHITECTS, BUILDERS, CONTRACTORS—all who are engaged on construction work—are keenly alive to the spirit of the times. Methods that were in vogue but a comparatively few years ago are discarded for other and *better* ways of doing the same things.

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(24)

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Your own prospective clients are constantly seeing these beautiful bathrooms fitted with Crane compact plumbing fixtures. Their "bathroom standards" are mounting accordingly. Study Crane advertising in the national magazines, and you can readily anticipate what beauty, comfort and convenience they want.

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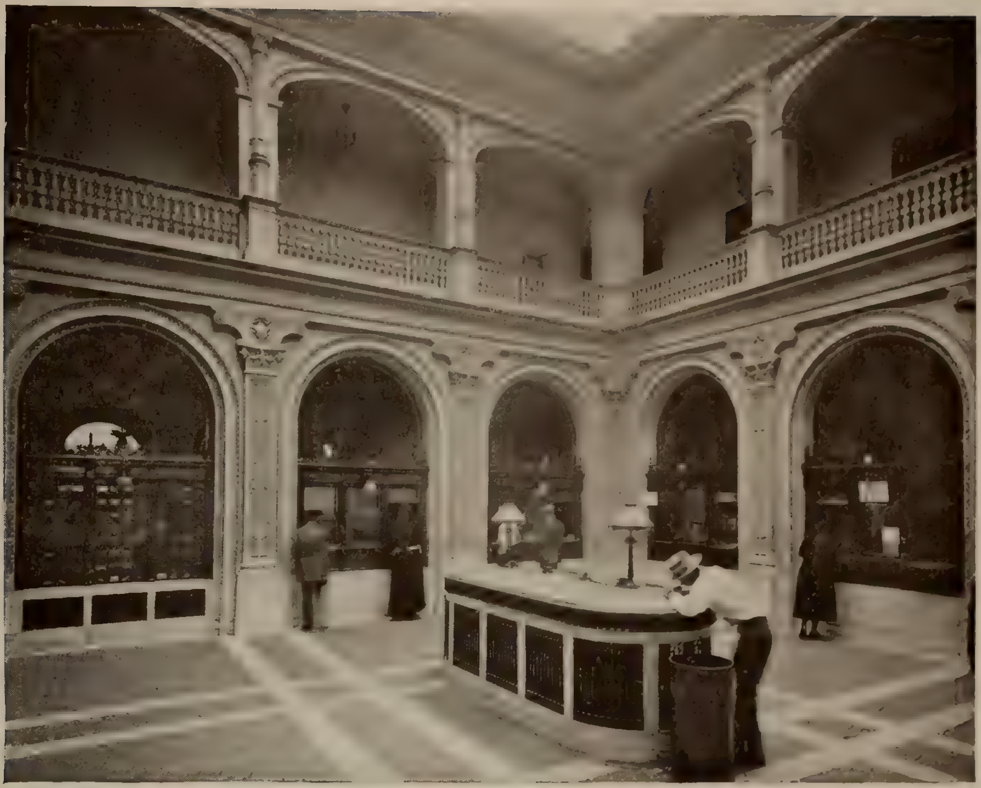

UNITED STATES POST OFFICE AT SANTA BARBARA, CALIFORNIA

James Knox Taylor, *Architect*

PHOTOGRAPH taken immediately after the earthquake showing undamaged condition of the Terra Cotta used for interior finish.

The same immunity from injury was encountered in other well constructed buildings using Terra Cotta throughout the devastated zone.

Write for Standard Specifications covering the requirements for proper construction in Terra Cotta and build securely against fire and earthquake risks.

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This massive building, just completed, is the first monolithic concrete structure erected in Birmingham.

By that we mean it is solid.

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concrete from basement to roof. Solid slag concrete foundation. Solid slag concrete frame. Solid slag concrete floors and roof. Solid slag concrete walls—no terra cotta or brick veneer for exterior finish.

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Slag Concrete is fireproof.
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MIAMI-BILTMORE Hotel, Coral Gables, Florida: Schultz & Weaver, Architects, New York; Kohler "Viceroy" built-in baths furnished by Monmouth Plumbing Supply Co., Jobbers, Miami; installed by Alex. Orr, Jr., Plumber, Miami

THE choice of Kohler "Viceroy" built-in baths—298 in all—for the magnificent Miami-Biltmore Hotel, now nearing completion at Coral Gables, Florida, again indicates the distinguished preference which this well-known Kohler model has won.

Architects have noted in all Kohler fixtures that fine proportion and grace of line which characterize the "Viceroy." And in the quality of the Kohler enamel itself, they have found the complement of that beauty.

The Kohler enamel is notable for its uniform snowy whiteness in all fixtures. And it is always marked with the name "Kohler" in faint blue letters—the sign of highest quality at no higher cost.

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Kohler Village is known to city planners and landscape architects as one of America's finest community developments. Its character is reflected in the quality of Kohler products—enameled plumbing ware and private electric plants

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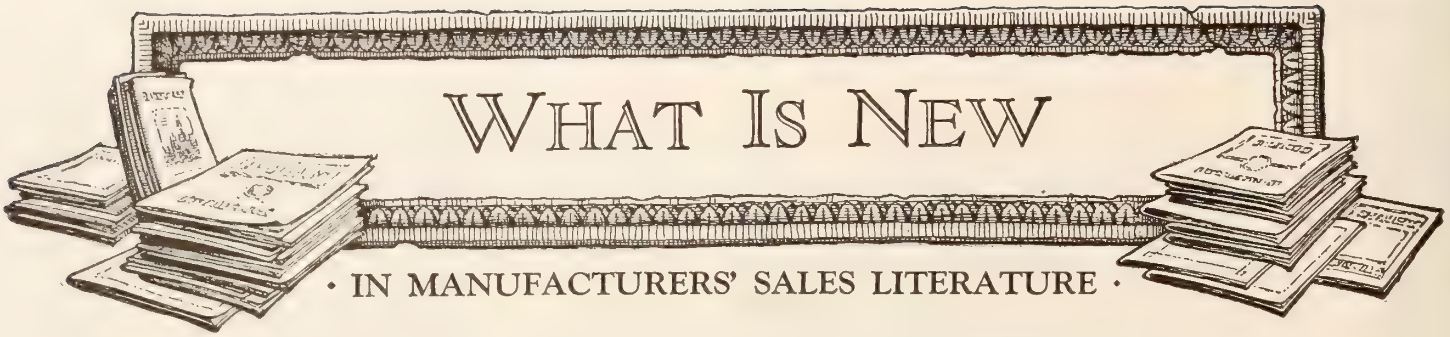

WHAT IS NEW

· IN MANUFACTURERS' SALES LITERATURE ·

Architects and every one interested will find here the latest and most up-to-date information on building equipment. These publications may be had by addressing SERVICE DEPARTMENT, ARCHITECTURE, 597 Fifth Avenue, New York, or by addressing the companies listed below, in which case please mention ARCHITECTURE

WHEN YOU PLAN PERIOD-TEXTURED PLASTERING

Many fine examples of the art of plastic decorating and valuable construction data are embodied in "Modern Modes in Better Plastering," issued by the Milwaukee Corrugating Co.

JOHN D. EMACK CO.

Wherein "Thatchslate" roofs differ is best told in Circular 21 published by this concern. Other circulars of interest to architects are 21-A on "Graduated Olde Stonesfield Roofs" and 21-C on "Flagging."

THE THATCHER COMPANY

A new catalogue fully describes and illustrates the new Thatcher Boiler.

WEATHERBEST COLORS

On red cedar will gladly be sent architects, together with a booklet showing comparative costs of Weatherbest Stained Shingles and clapboards for sidewalls.

350 DIFFERENT DESIGNS

In exterior lighting fixtures are included in the new Smyser-Royer Catalogue "J." It is a complete treatise on lamps, brackets, standard and special lighting fixtures.

THE FINANCIALIST

A monthly journal, issued by the Hockenbury System and devoted to community hotel finance, will gladly be sent to architects.

"THE E. S. ELEVATOR DISPATCHING SYSTEM"

Describes a new system of operating elevators. The booklet is part of the interesting literature of the Elevator Supplies Company.

"COLOR HARMONY IN MORTAR AND BRICK"

Shows how care in the selection of proper mortar color for any structure enhances its monetary value and makes a pleasant effect at all times. The booklet contains a number of color reproductions.

THE GYPSUM INDUSTRIES

Are publishing a re-edition of the article on "Gypsum Plaster and Fire Protection." A copy will be sent architects at their request.

RICHARDS-WILCOX COMPANY

A folder describes and illustrates the new Single Knob Garage Door Controller. By the use of this equipment, two swinging doors are opened by pulling on the handle on one of the doors.

CONSTRUCTION OF SWIMMING-POOLS

Bulletin 500 and specification form, published by the Graver Corporation, contains data for the design and construction of both indoor and outdoor swimming-pools.

THE DURASTONE COMPANY

Interior and exterior installations of Durastone Brand Cement are illustrated and described in a handsome book published by this concern.

FIREPROOF CONSTRUCTION

The General Fireproofing Co. say that, "If you are not entirely familiar with Self-Sentering, write for the GF Fireproofing Handbook. It will give you the latest authoritative information on fireproof reinforced concrete construction."

NATIONAL TUBE COMPANY

Large and important buildings in which National Pipe has been installed are shown in National Bulletin No. 25. This publication contains useful data on pipe for building purposes.

TERRA-COTTA AND ITS USE

Standard Specifications for the manufacture, furnishing and setting of terra cotta with other literature of assistance to the designer will be furnished on request.

STRUCTURAL SLATE

Complete specifications, drawings, and other data are of unusual interest to architects; they are published by the Structural Slate Company.

"BINGO OF FLATHEAD"

Is an interesting story of Pondosa Pine.

ARMSTRONG CORK TILE

Architects will find much of interest in the 32-page illustrated book, "Armstrong's Cork Tile Floors." A sample of tile will be sent with the book.

THE ELLISON WINDOW OPERATOR

The International Casement Co. are issuing an interesting new architectural leaflet on the "Ellison Casement Operator."

SANITAS STYLES IN SAMPLE

Standard Textile Products have on hand a sample book that is of great interest to the profession in their selection of styles for every room in the house.

DAHLSTROM ELEVATOR INCLOSURES

Literature is being issued by Dahlstrom metallic Door Company with illustrations and drawings on the above equipment.

"ENGLISH PRECEDENT FOR MODERN BRICKWORK"

A 100-page book beautifully illustrated with halftones and measured drawings of Tudor and Georgian types and American adaptations is issued by the American Face Brick Ass'n. There is a charge on the book.

HANDBOOK FOR ARCHITECTS

How Brixment is applied and its qualifications are described in literature published by the Louisville Cement Company.

"MILLER PLAN OF FINANCING"

Booklet L-200 describes the plan of G. L. Miller & Co., whereby the owner is enabled to carry out the building as planned by his architect.

THE PHILIP CAREY COMPANY

There are Carey specifications to meet every kind of roof conditions. Architects are requested to write for "The Specification Book."

HERMAN NELSON CORPORATION

The necessity and the economy of Univent Ventilation is shown in the Architects' Edition of Univent Ventilation. It tells why Univent is being installed in new and old school buildings.

HARTMANN-SANDERS

Catalogue B-47 gives full details of Koll Lock-Joint Colonial Columns.

HARTFORD-SAXONY RUGS

A new book is available to architects and their clients describing these rugs and showing typical room scenes in color.

THE "FACTS" BOOK

That Keystone Copper Steel has demonstrated its worth in the service tests of the American Society of Testing Materials, also other facts and descriptions, are found in "Facts," issued by the American Sheet and Tin Plate Co.

THE RESULTS OF TILE

Batchelder Tiles for fountains, mantels, pavements, wainscotings and baths, with illustrations of handsome interiors, are described in the literature of Batchelder-Wilson.

COLT'S PATENT FIRE ARMS CO.

The "Architects Packet" illustrates methods of planning efficient dishwashing installations. Architects will find the data covering the space and money-saving features of Autosan especially interesting.

MEETING OF THE PRODUCERS' RESEARCH COUNCIL

The semi-annual meeting of The Producers' Research Council, affiliated with the American Institute of Architects, will be held in Chicago on November 10th and 11th at the Club House of the Chicago Chapter, A. I. A.

The meeting will be addressed by Mr. N. Max Dunning, Technical Director of the Scientific Research Department, A. I. A.; Mr. Harry Wheelock, President of the Chicago Chapter, A. I. A.; and Mr. Charles E. Fox, President of the Illinois Society of Architects.

A cordial invitation is extended to all architects to attend all sessions of the meeting.

BONDED FLOORS

Of distinct interest to architects is the new series of pattern charts on Treadlite Tile recently issued by the Bonded Floors Company. These sheets show eleven standard colors in which this resilient cork-composition tile may be obtained. Architects who wish a complete set of these attractive pattern sheets may obtain the whole series.

THE DURIRON COMPANY

The Building Equipment Department announce the appointment of Mr. John C. Candler as their representative in Georgia, at 315 Glenn Bldg., Atlanta.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION

At their convention to be held November 11–14 at White Sulphur Springs, W. Va., the following imposing list of speakers will be heard: Franklin D. Roosevelt, Secretary Herbert Hoover, United States Senator Geo. H. Moses, and Ex-Governor Channing Cox.

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Wood-Rolled Steel Construction *Metal Covered-Hollow Metal Construction*

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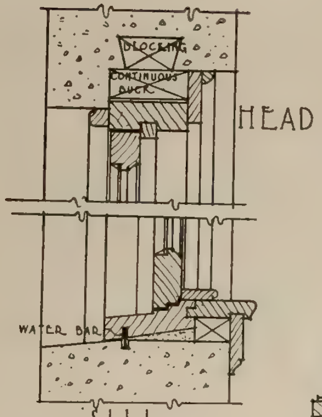
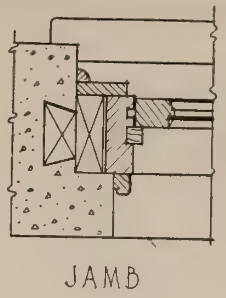
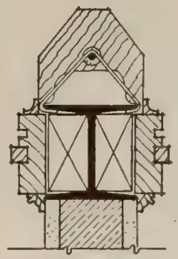
AUSTRAL WINDOWS control the Light and Ventilation in this fine school building.



DETAIL "A" SUGGESTED TREATMENT FOR CONCRETE WALLS





DETAIL "B" - SHOWING A WINDOW WITH A TERRA COTTA MULLION REINFORCED WITH AN I BEAM.

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1. Light is regulated and controlled by the arrangement of shades on sash. Awnings are not necessary.
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Residence of Robert Law, Jr., Port Chester, N. Y. Dwight James Baum, architect, New York, N. Y., Hauxwell and Smith, Inc., Port Chester, N. Y., plumbing contractors.

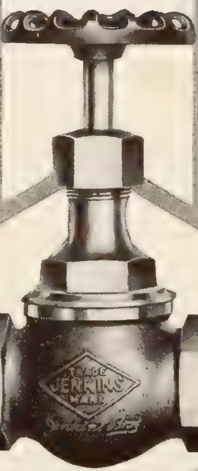

Fig. 106
Screwed, Jenkins Standard Bronze Globe Valve

Residence in Westchester County, N. Y. Arthur T. Remick, architect, New York, N. Y., C F. Mentzinger's Son, Brooklyn, N. Y plumbing contractor.

Good valves contribute to comfort and convenience

Residence in Briarcliff Manor, N. Y. Arthur T. Remick, architect, New York, N. Y., C. F. Mentzinger's Son, Brooklyn, N. Y., plumbing contractor.

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Freedom from plumbing and heating annoyances is something to be taken for granted by the owner of a fine country house. Faultless service is expected in homes of distinction.

Rigid insistence upon quality standards in all equipment is the only way to insure the kind of service that a good-looking exterior promises.

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The homes illustrated are representative of hundreds of country houses—large and small—in which Jenkins Valves are used. Be sure you specify, as the architects of these residences did, "valves shall be genuine 'JENKINS,' bearing the name, 'JENKINS' within a diamond mark."

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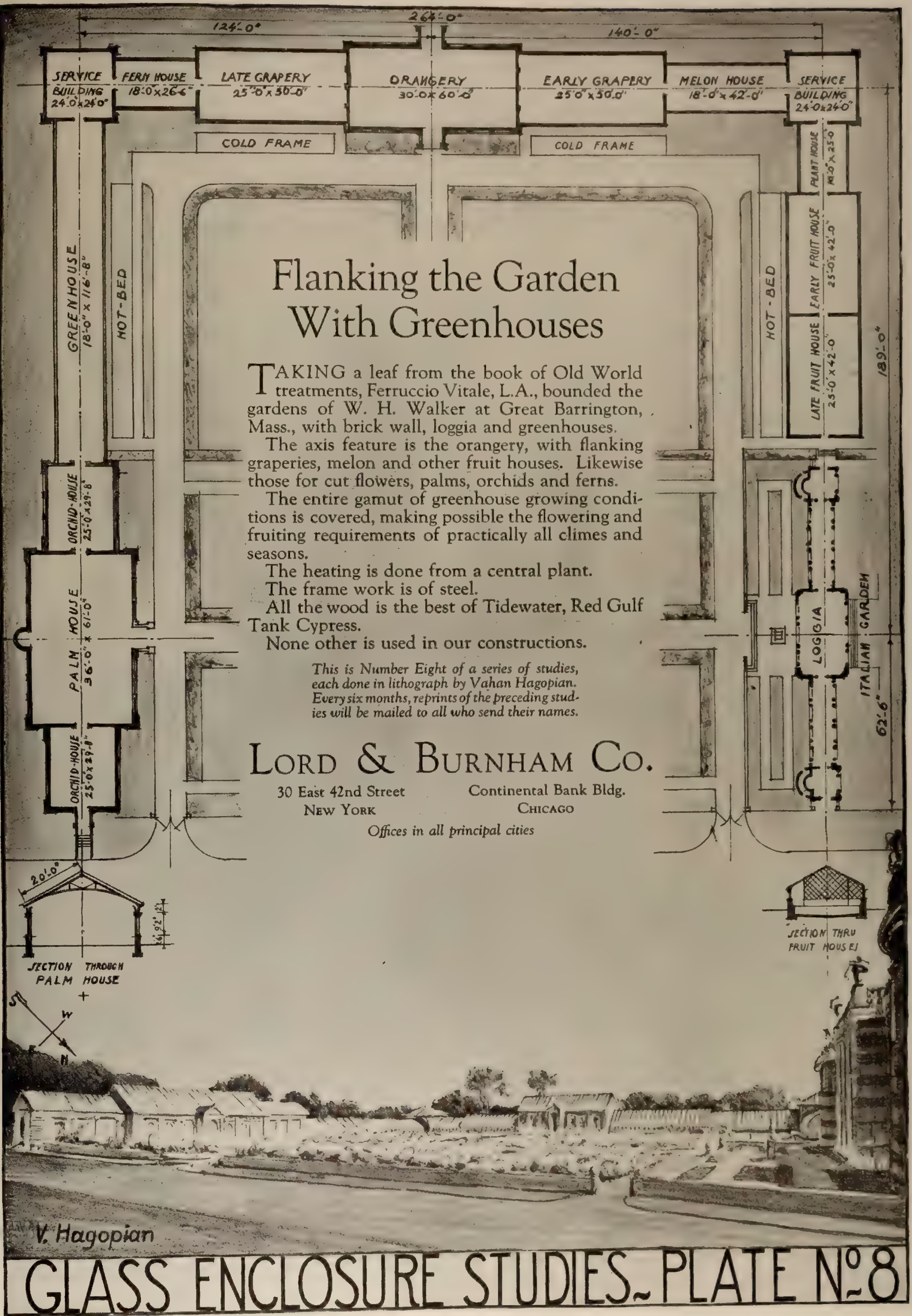

Flanking the Garden With Greenhouses

TAKING a leaf from the book of Old World treatments, Ferruccio Vitale, L.A., bounded the gardens of W. H. Walker at Great Barrington, Mass., with brick wall, loggia and greenhouses.

The axis feature is the orangery, with flanking graperies, melon and other fruit houses. Likewise those for cut flowers, palms, orchids and ferns.

The entire gamut of greenhouse growing conditions is covered, making possible the flowering and fruiting requirements of practically all climes and seasons.

The heating is done from a central plant.

The frame work is of steel.

All the wood is the best of Tidewater, Red Gulf Tank Cypress.

None other is used in our constructions.

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Youth—impulsive, impressionable, responsive—finds an understanding friend and guide in the architect.

His skill has stripped learning of its austerity and clothed it in beauty.

His keen perception has made the modern school typify, at the same time that it serves, the spirit of youth.

His buildings, in which education is housed, are both the inspiration to youthful accomplishment, and the safeguard of health, by which these accomplishments may be realized.

To the architect belongs in large measure the credit for Univent Ventilation with its many benefits. His insistence has introduced this simple, positive system into many schools.

The Architect's Edition of "Univent Ventilation" will be mailed without obligation upon request.

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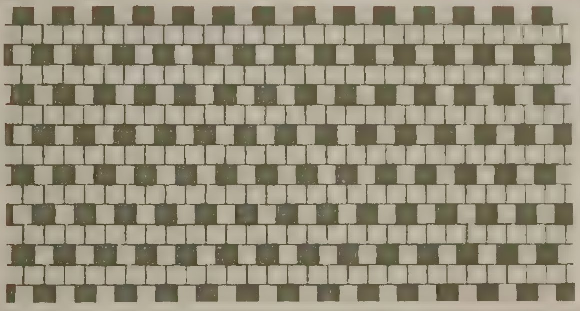

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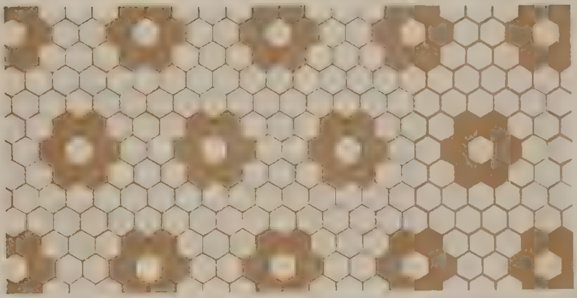

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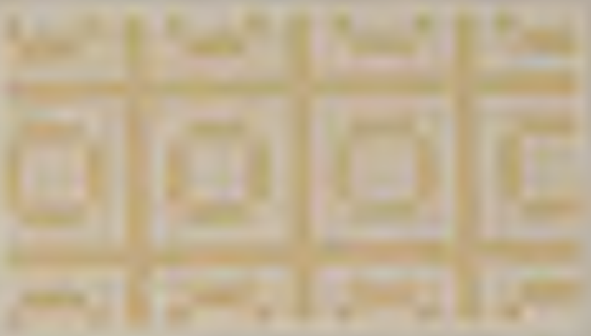

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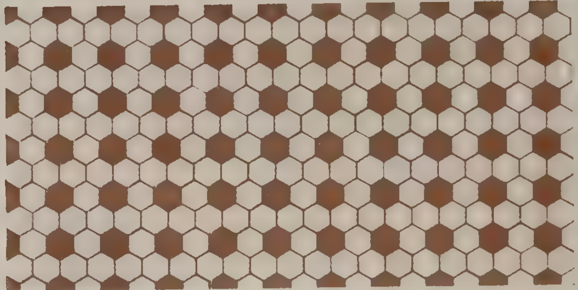

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NORTON FLOORS

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STEEL WINDOWS EVERYWHERE

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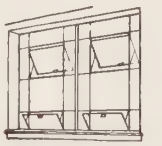
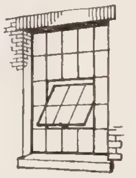
Projected Sash



First made by Lupton, this type of sash has met with constantly increasing popularity for factories, office buildings and schools. Easily operated ventilators stay open in any position. Made in Architectural and Industrial styles.

Pivoted Sash



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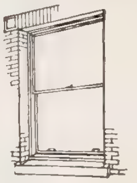

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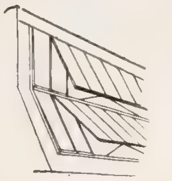

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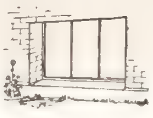

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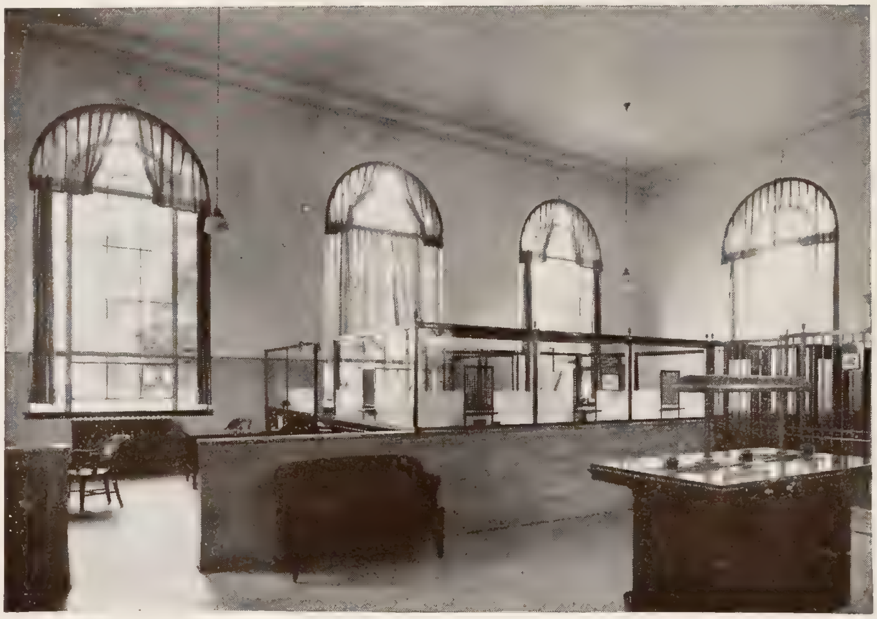

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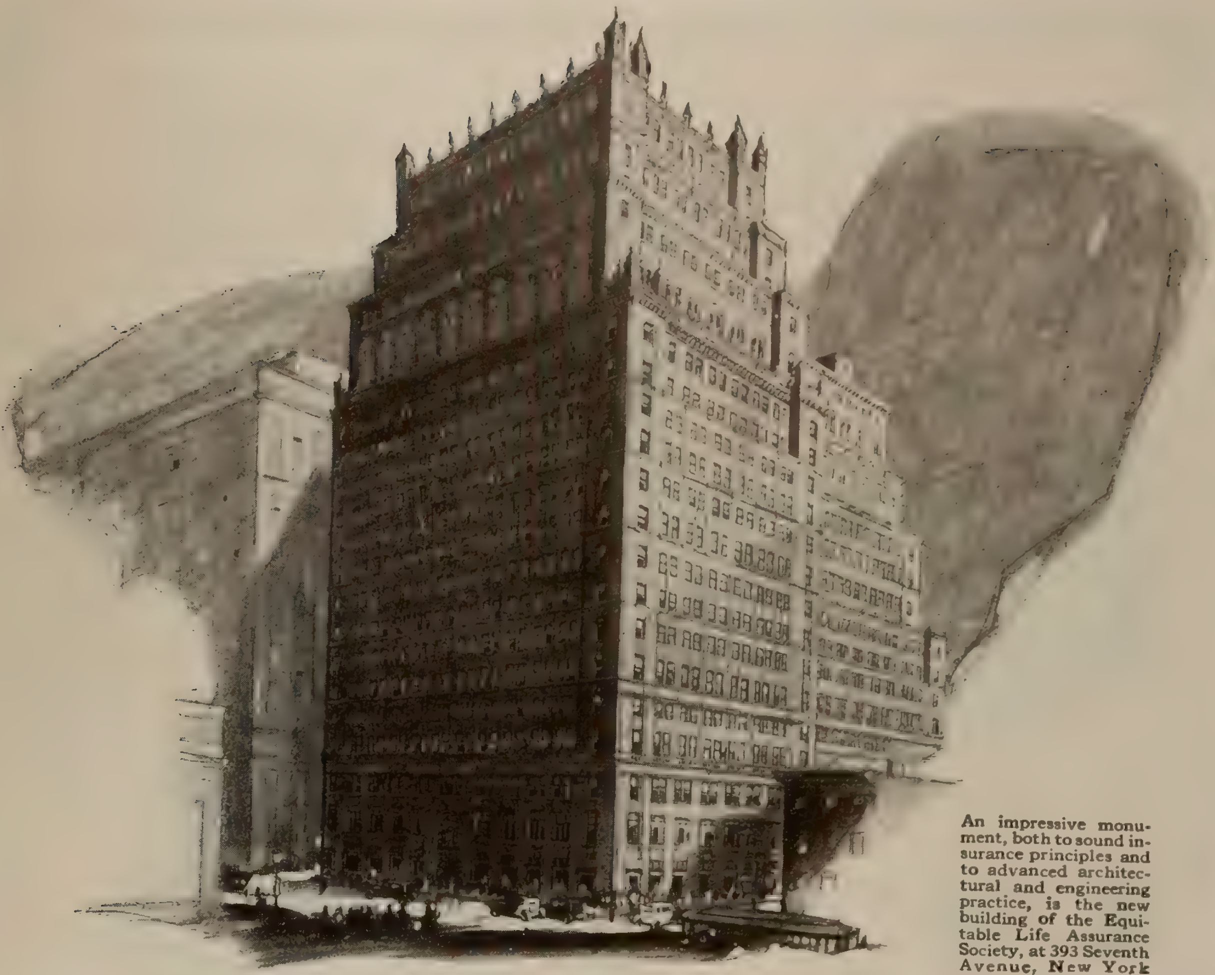

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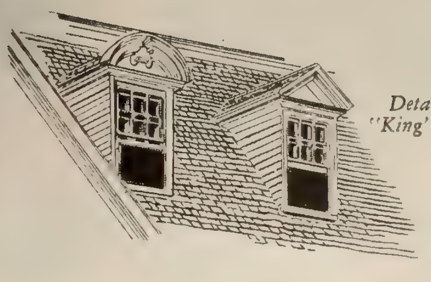

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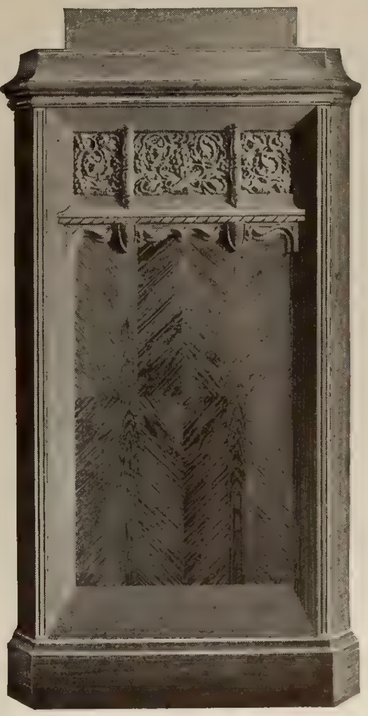

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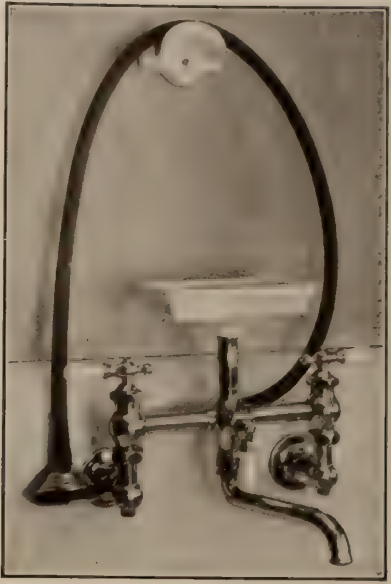

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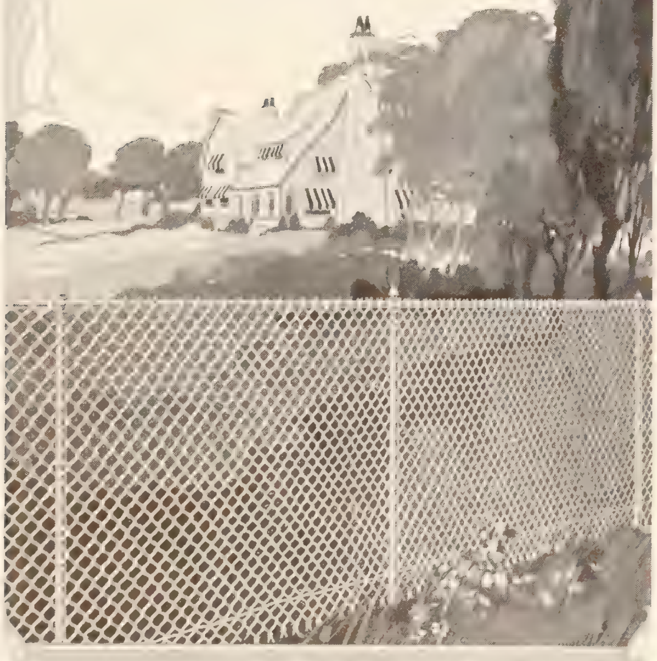

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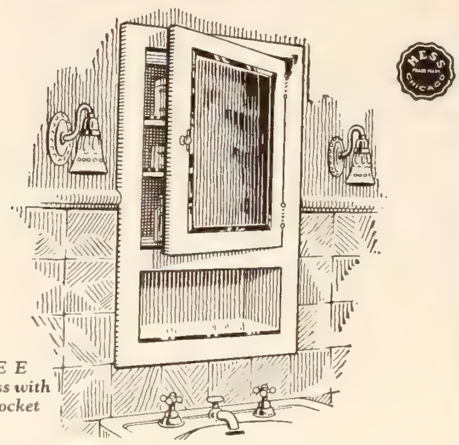

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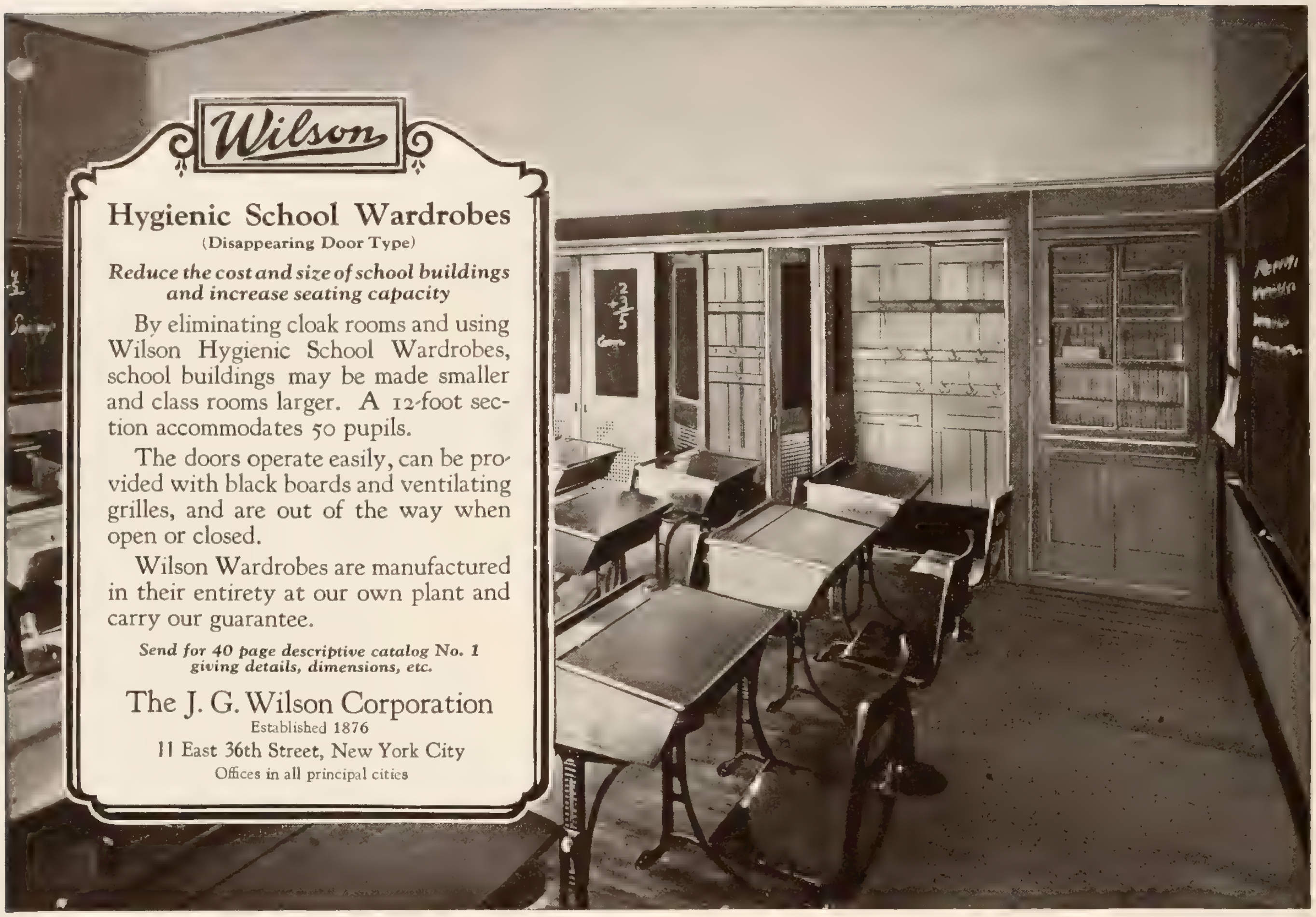

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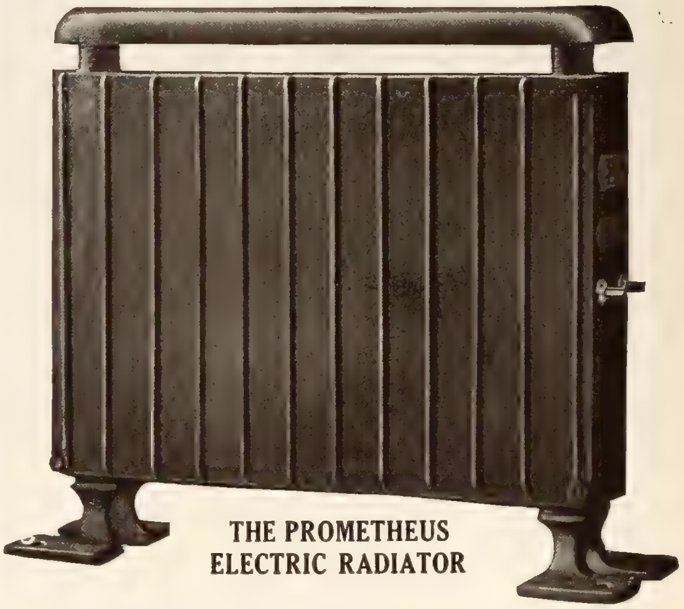

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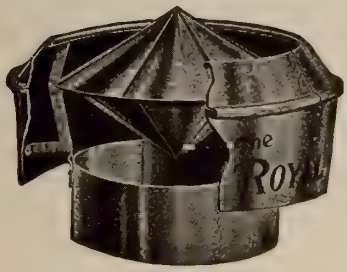

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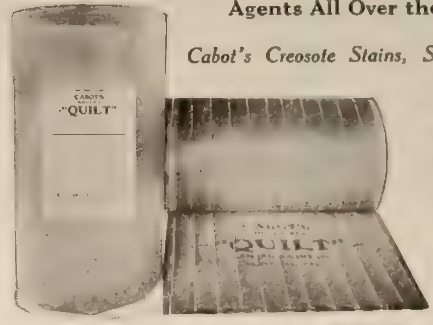

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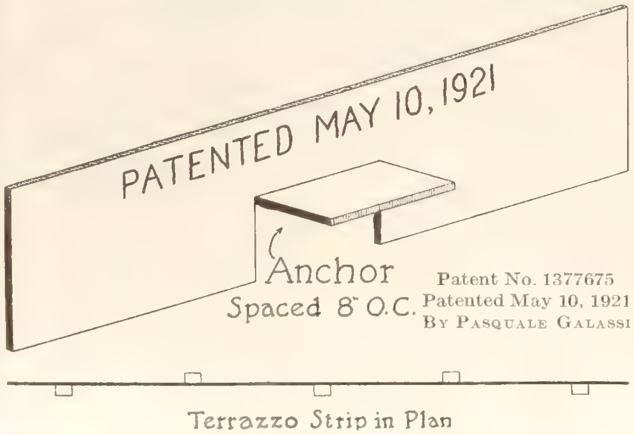

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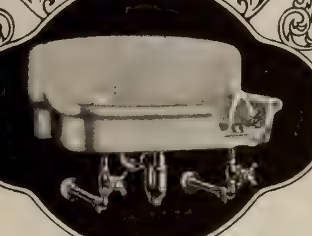

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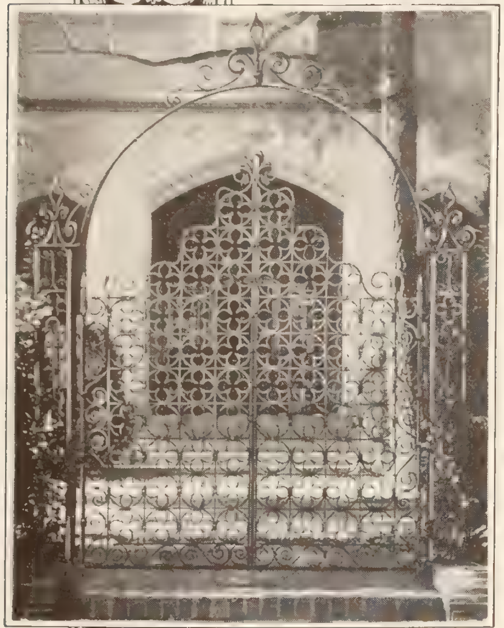

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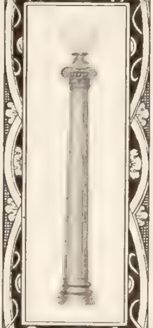

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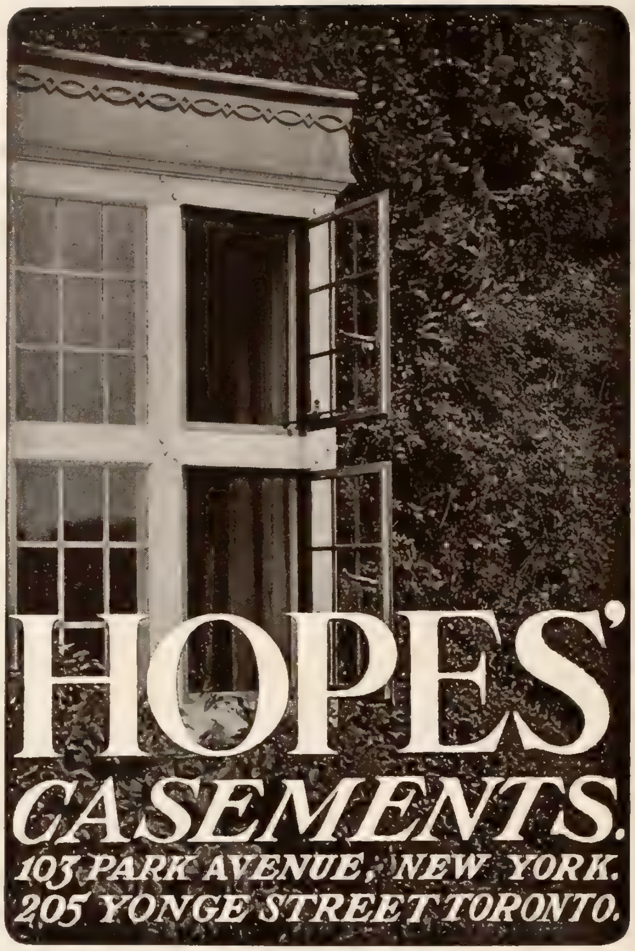

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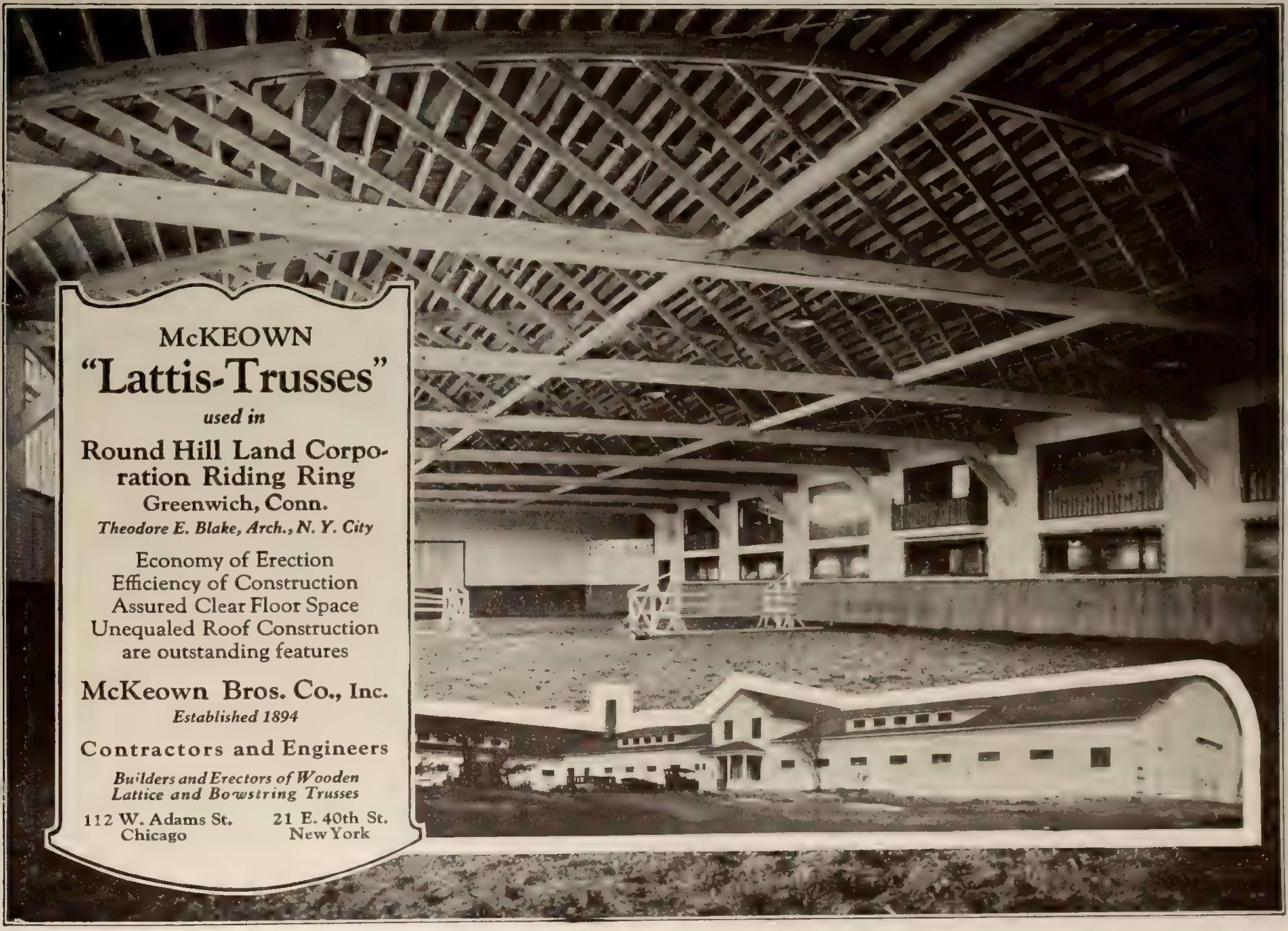

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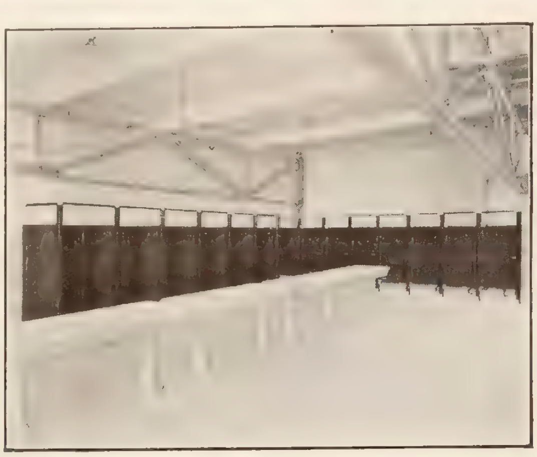

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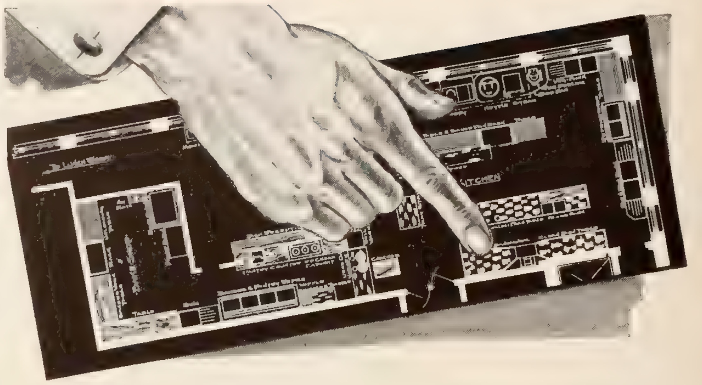

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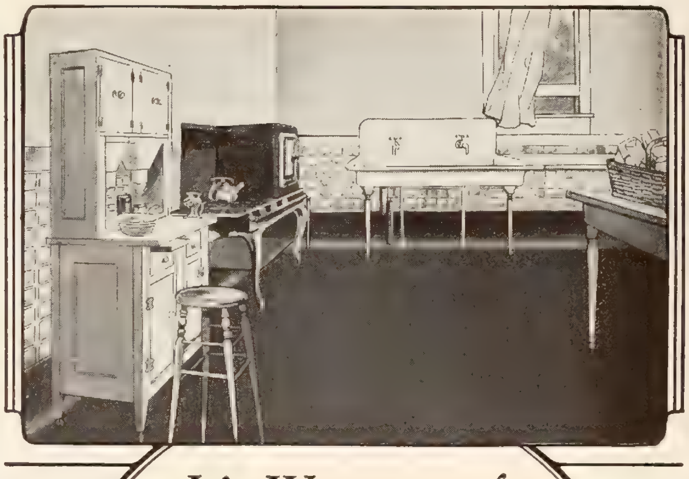

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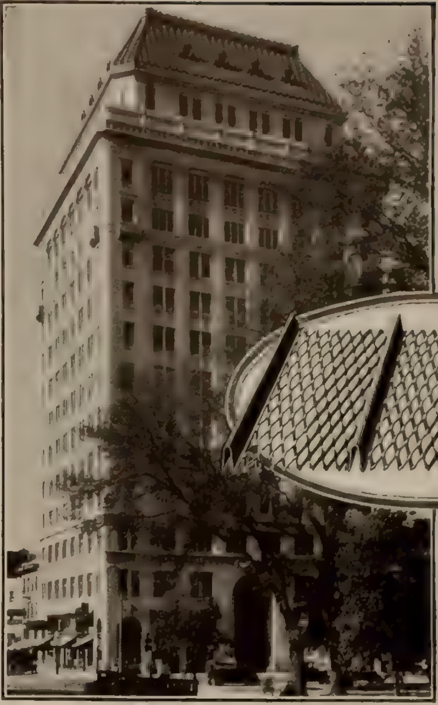

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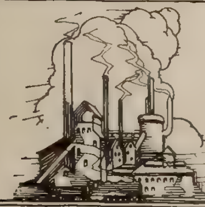

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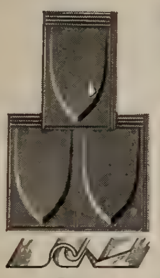

Fig. 157

Note the construction of patent Interlocking Device used on Edwards Metal Shingles and Spanish Tile

Fig. 367

Metal Spanish Tile for main part of roof.

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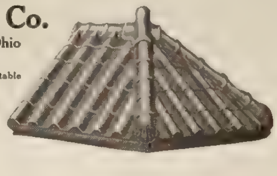

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Below.—*Exterior, Roosevelt School, Charles M. Baker, Architect, Framingham, Mass.*

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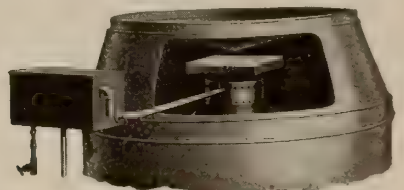

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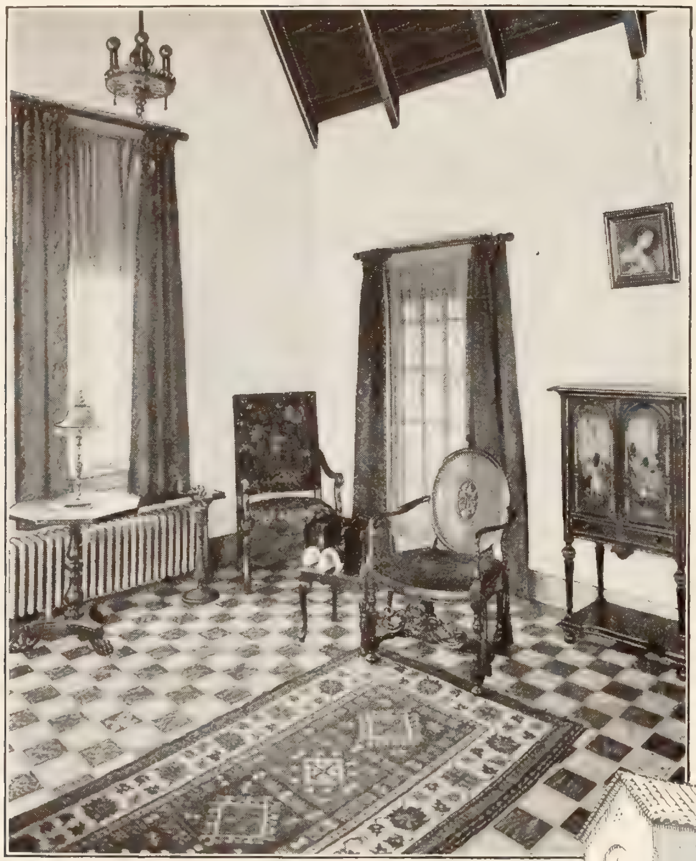

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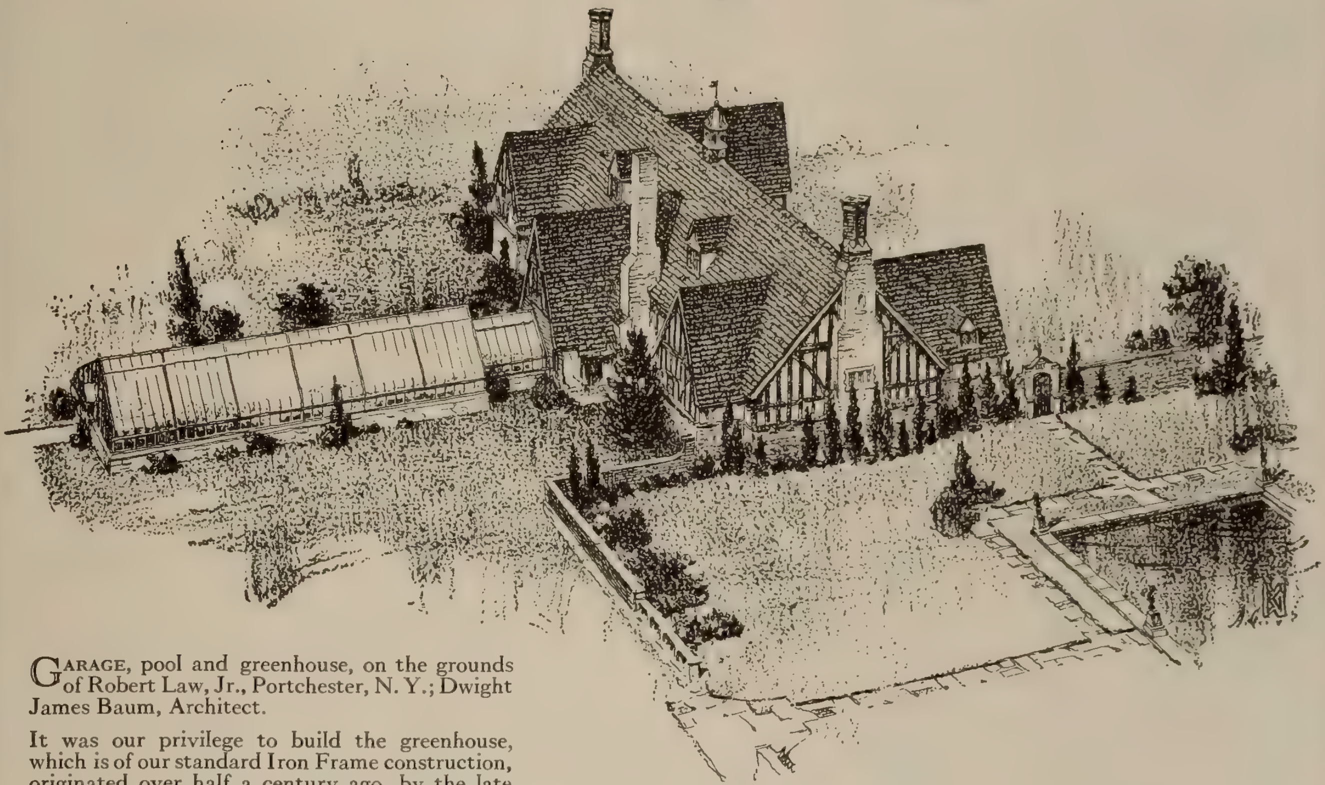

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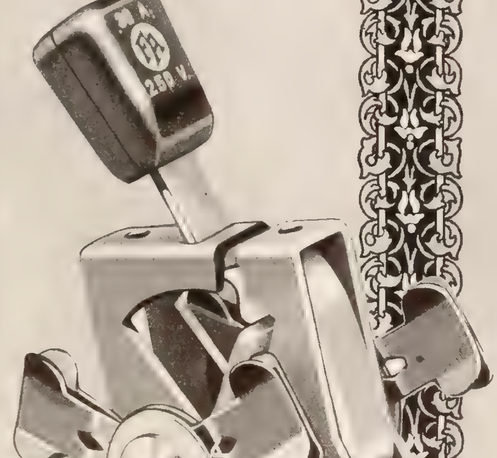

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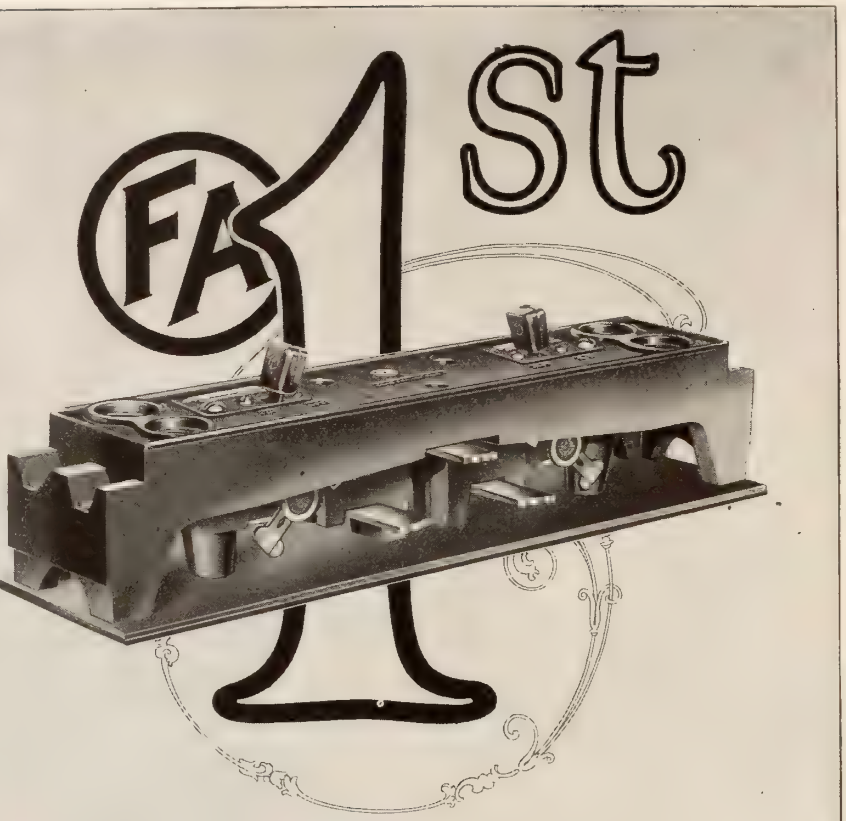

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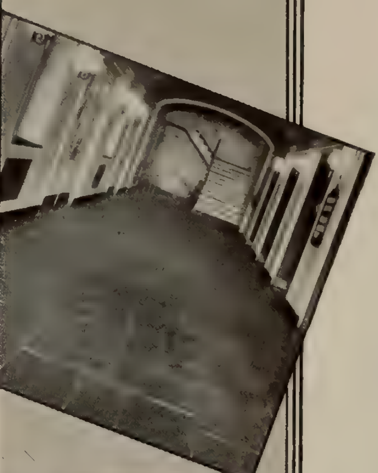

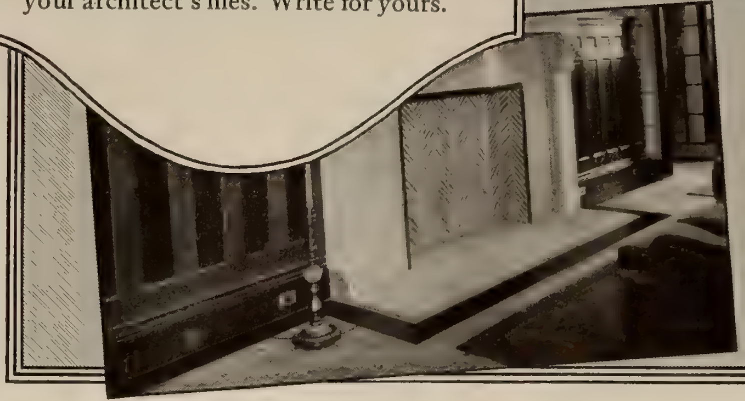

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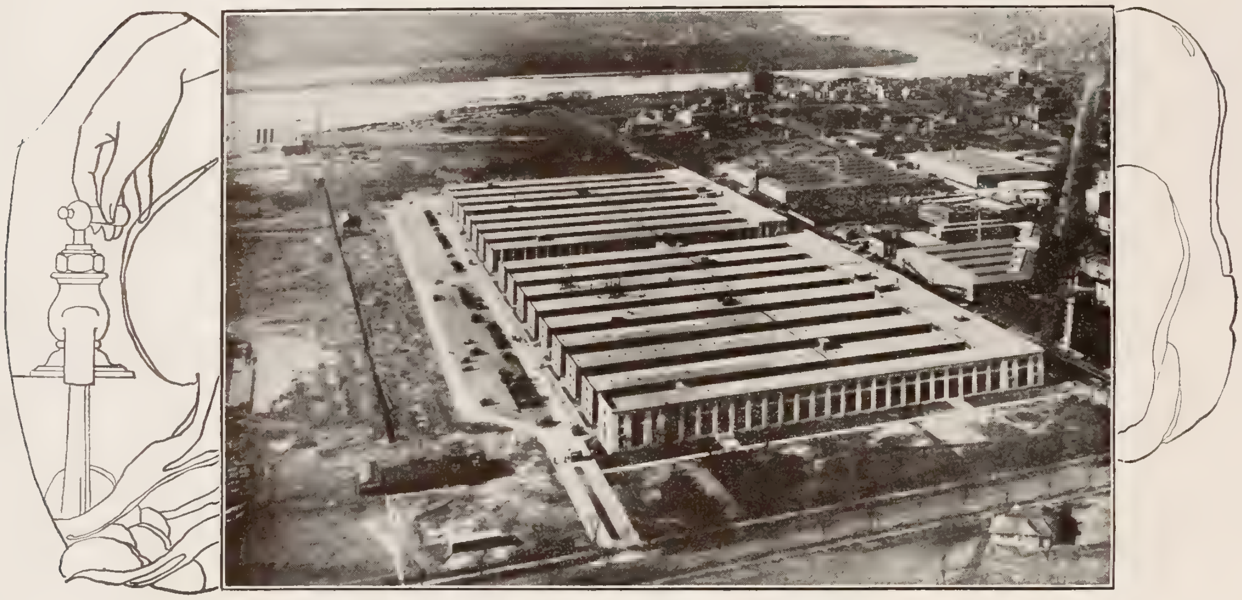

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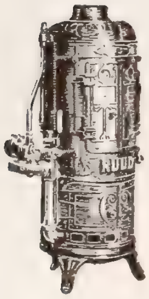

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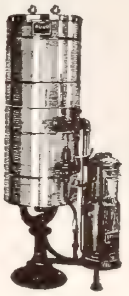

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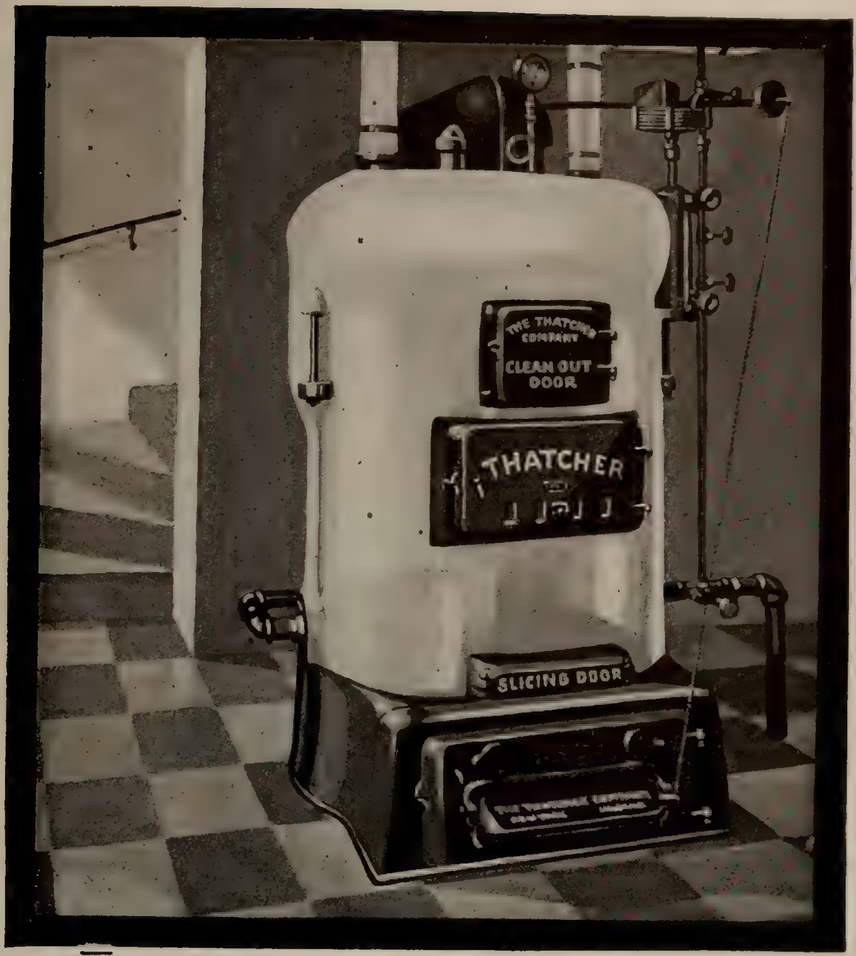

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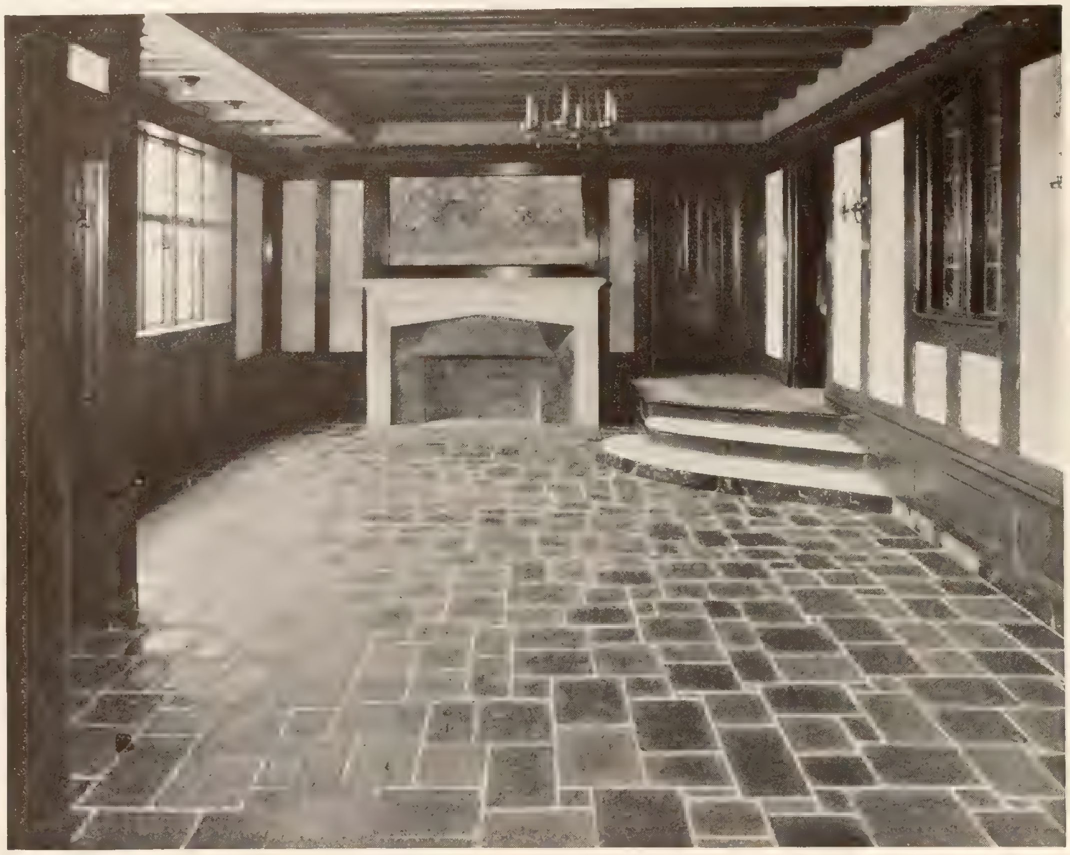

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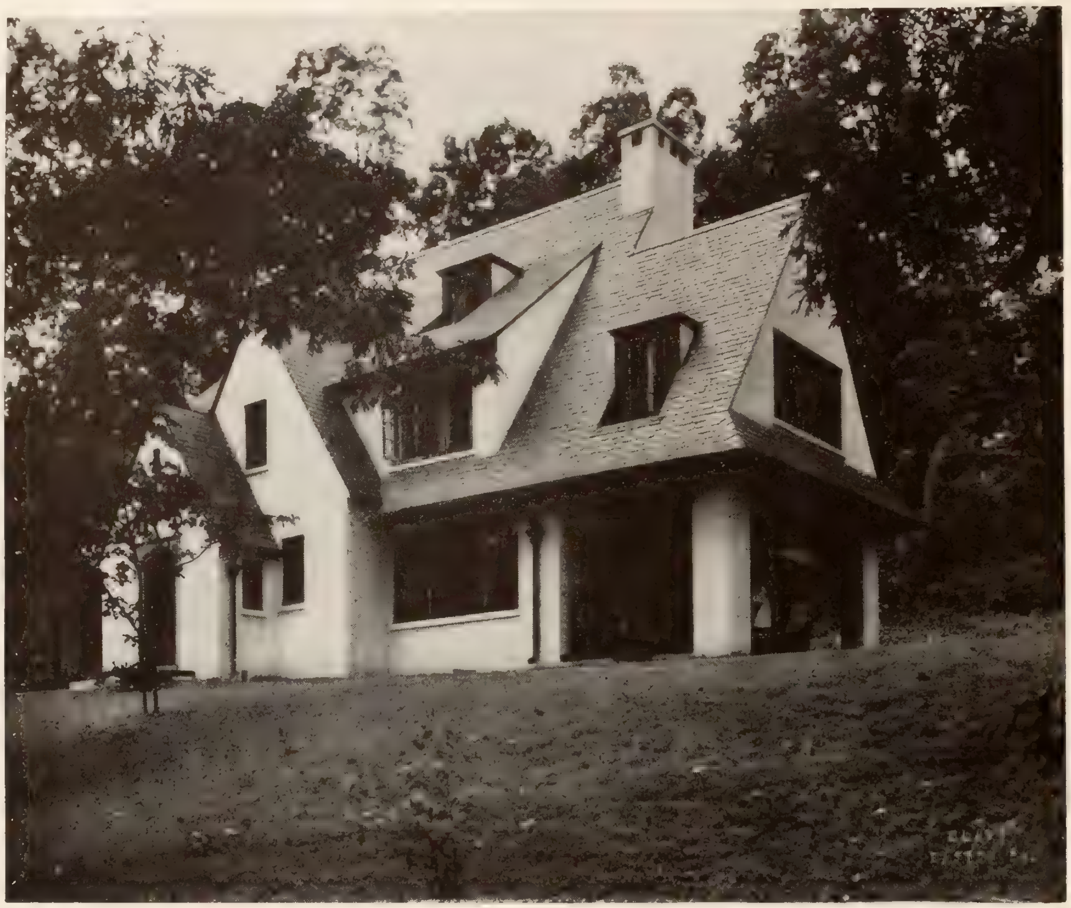

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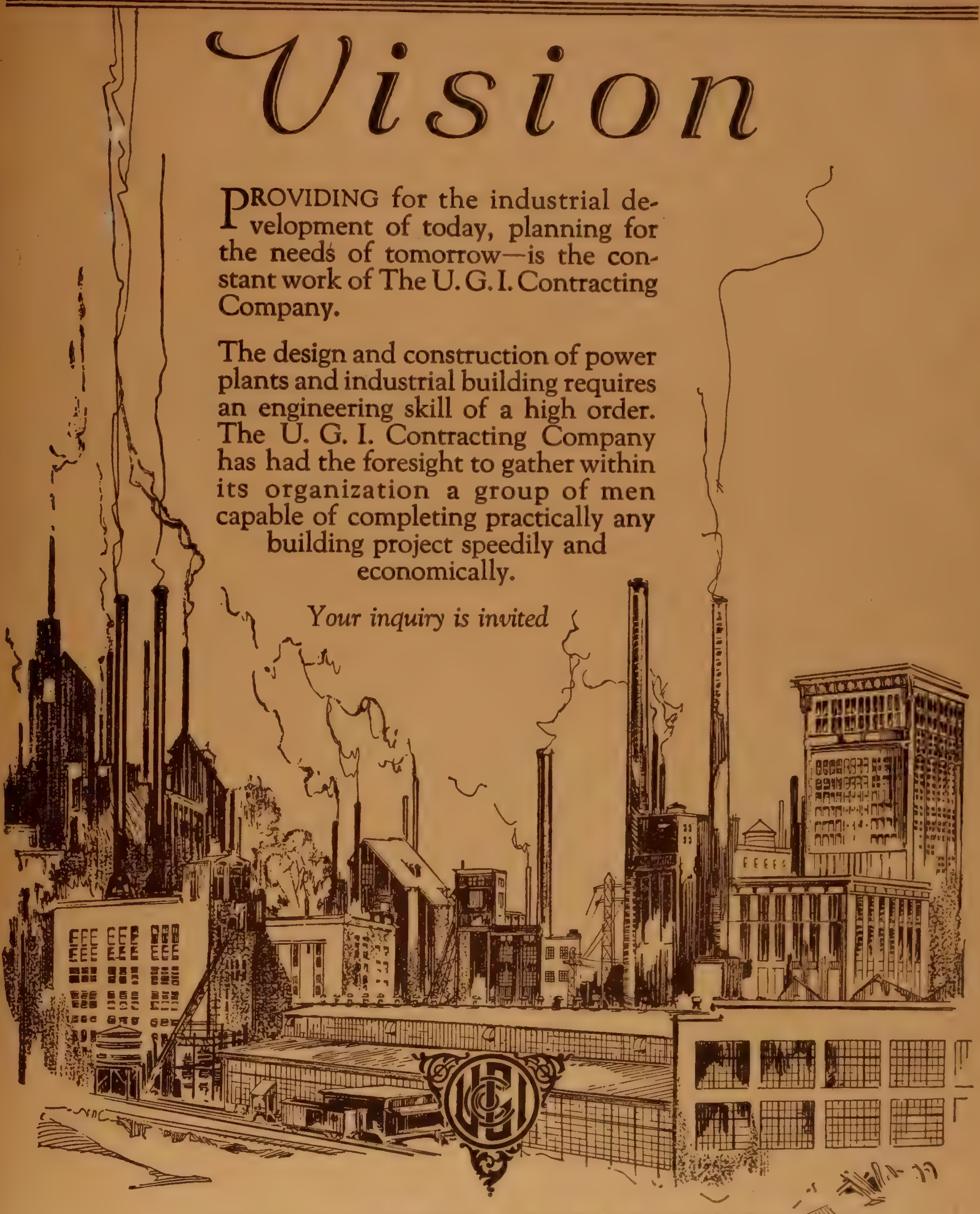

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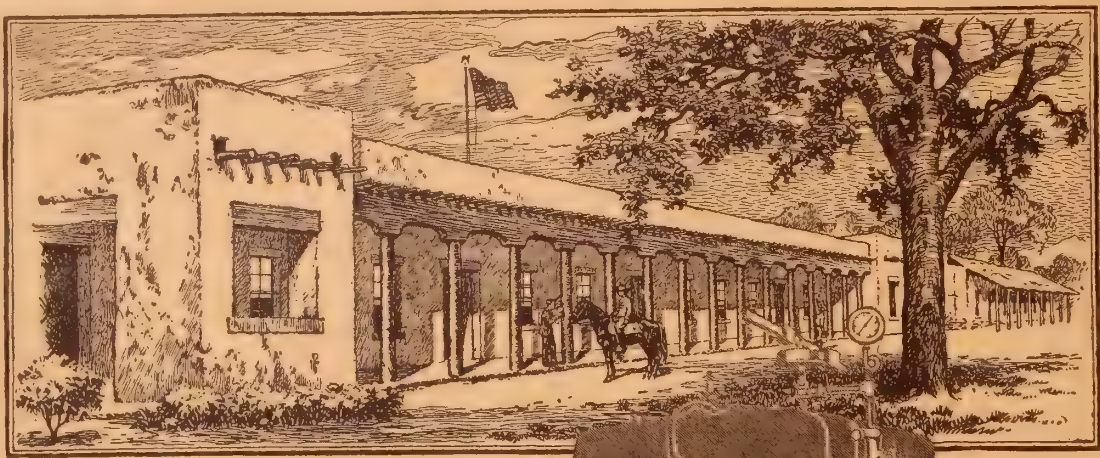

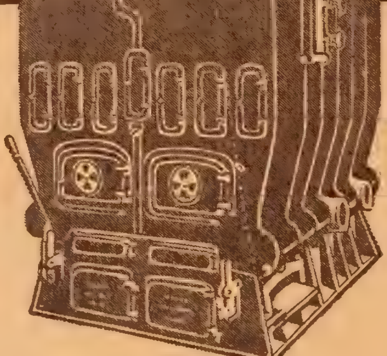

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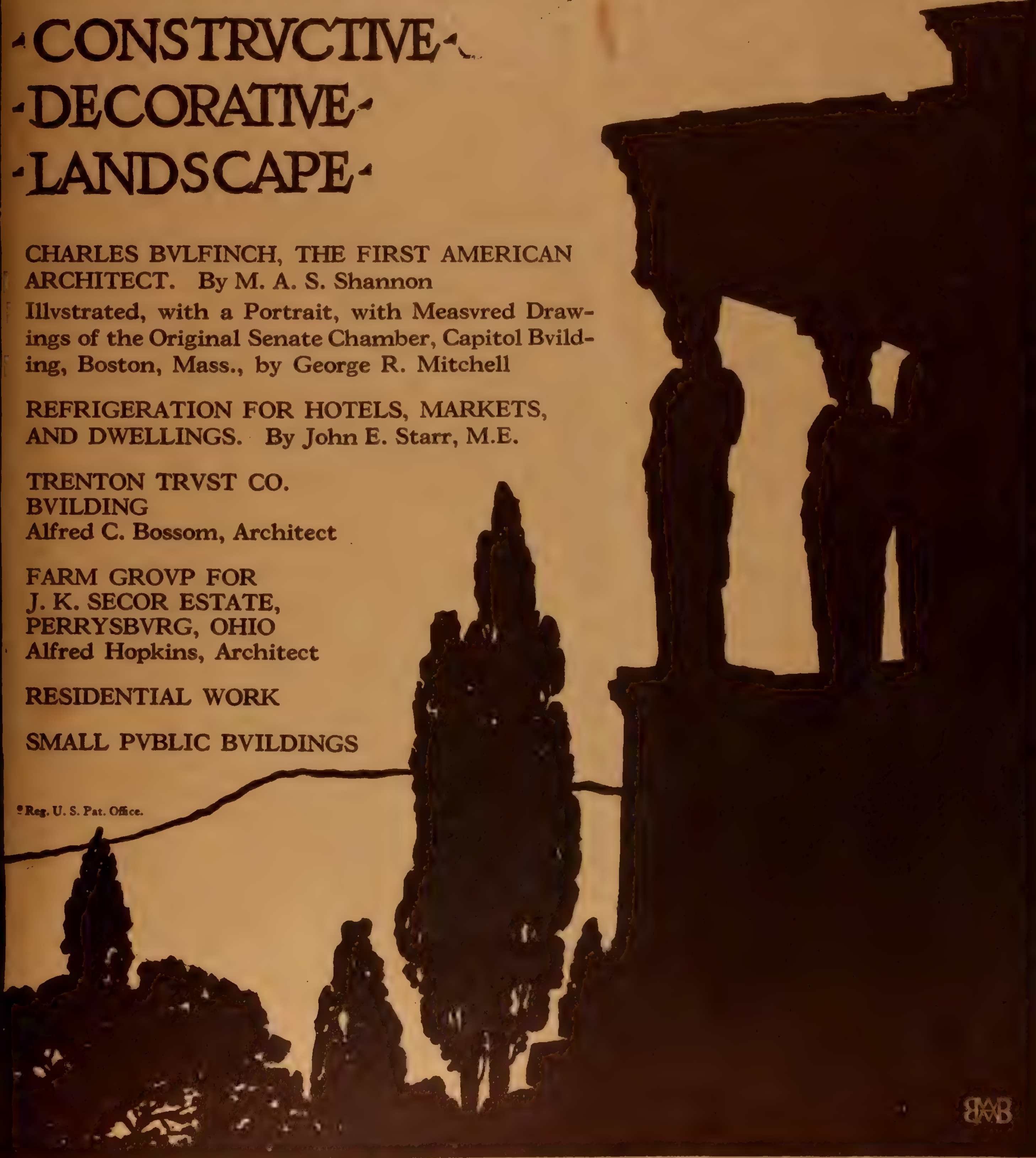

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"Discriminating people had never told me that New York had so much beauty. The famous silhouette of New York did not impress me [possibly because I saw it first in a Scotch mist] so much as some individual buildings, notably the Shelton Hotel, and the gay, delicate handsomeness of Park Avenue and Lexington Avenue, with their charming brickwork. The newer the buildings the better in this happy city. The combinations of marble or Indiana stone and brick are usually simple and effective.

PARK AVENUE, NEW YORK
Looking southwest from Sixty-sixth Street

VANDERBILT AVENUE, NEW YORK
Looking northwest from Grand Central Station Viaduct

The American architects seem to have given themselves to the study of brick with characteristic closeness and intelligence, and everywhere one came on new signs of their mastery of the subject.

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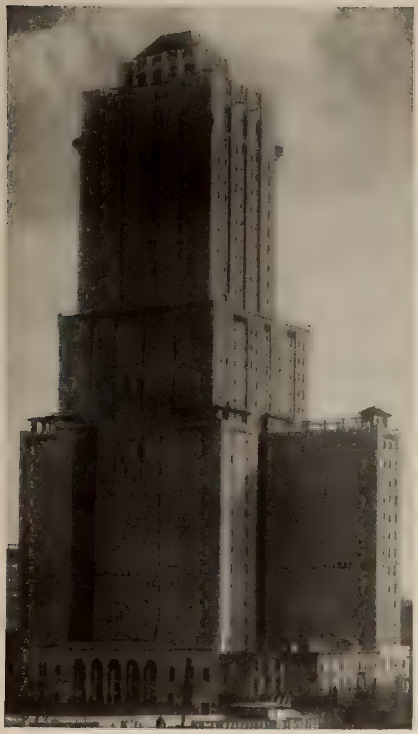


THE SHELTON HOTEL
Arthur Loomis Harmon, Architect

"The brick varies in color from an unsuccessful lemon white to deep red, with some particularly fine oatmeal tints in the later buildings that take the sunlight with a radiant sweetness. One had the ridiculous fancy about the Americans that after a generation of breakfast-food eaters the oats were now coming out in their architecture. In the clear, gay atmosphere of Manhattan these oatmeal palaces are delightful, even lovely at times, as they take the glow. [Why should our own new Regent Street not have been of brick?]" J. B.

EUROPE can show many fine examples of brickwork but these in no way compare in the scope of color and texture with the varied product our manufacturers offer.

In fact so great is this range that it really presents a new material to the American architect who is thus challenged to develop to the fullest possibilities this wonderful structural and artistic material.

AMERICAN FACE BRICK ASSOCIATION
1753 Peoples Life Building · Chicago

Soft Maple Terminal Dam completed July 27, 1925

Placer Engineering~

A project now practically completed which has attracted widespread attention is the Soft Maple Development which The U. G. I. Contracting Company is building for the Northern New York Utilities, Inc.

This 20,000 H.P. development presented such an array of natural difficulties that its successful completion has attracted the genuine interest of contemporary engineers who realize the magnitude of this undertaking.

By the full hydraulic method of construction a dam wall has been thrown across a wide valley.

Private or public utilities will find in The U. G. I. Contracting Company an organization with the ability to economically complete its building program regardless of size or unusual engineering features.

THE U·G·I·CONTRACTING COMPANY

Peoples Gas Building
CHICAGO

Philadelphia, U. S. A.

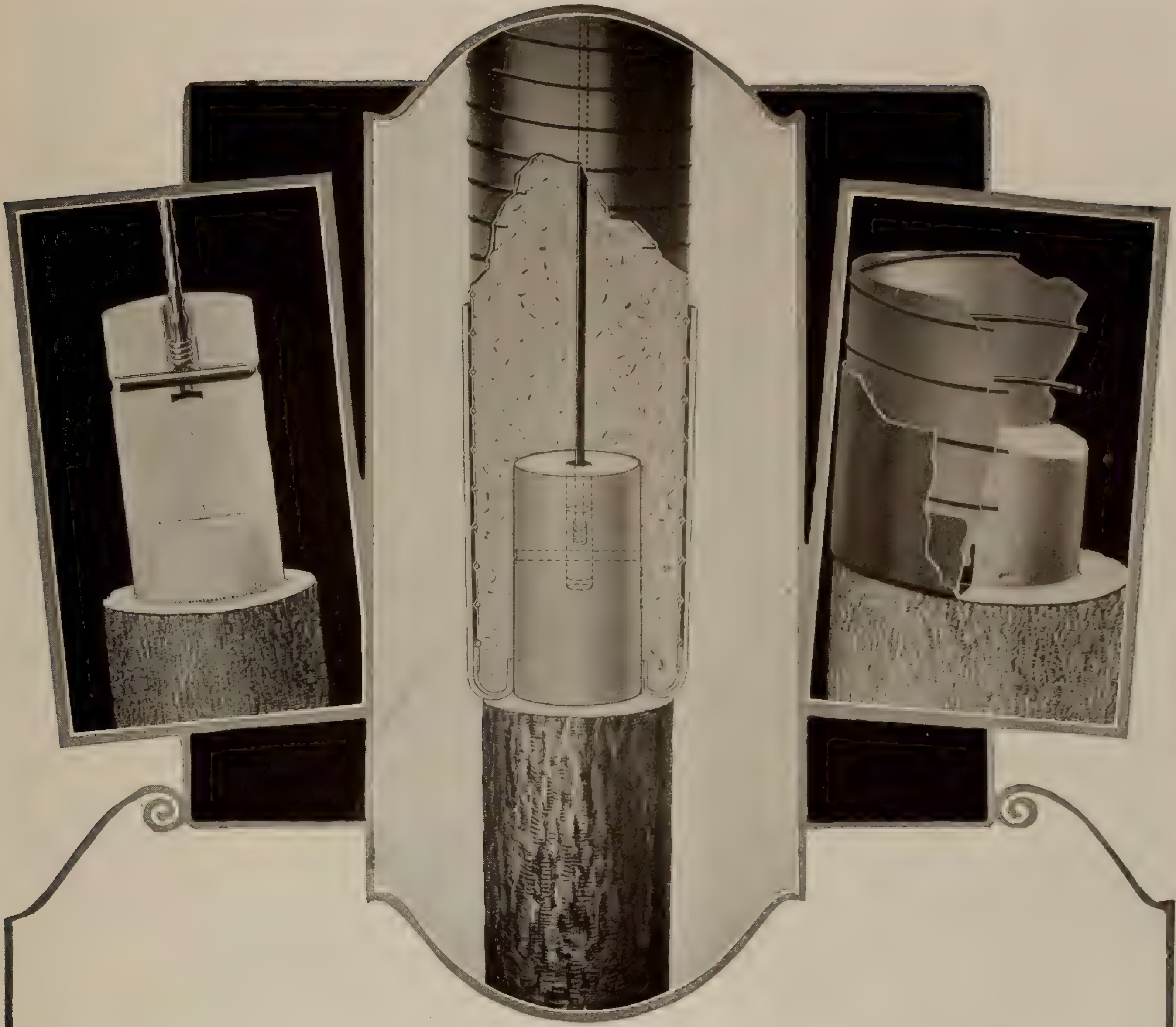
Union Trust Building
PITTSBURGH

BUILDERS OF

Industrial Plants *Steam Power Plants* *Hydro Developments* *Gas Plants* *Public Works*

Sluicing in Barrow Pit No. 4 for Division Dam

View taken along top of Terminal Dam, June, 1925



Raymond Composite Piles

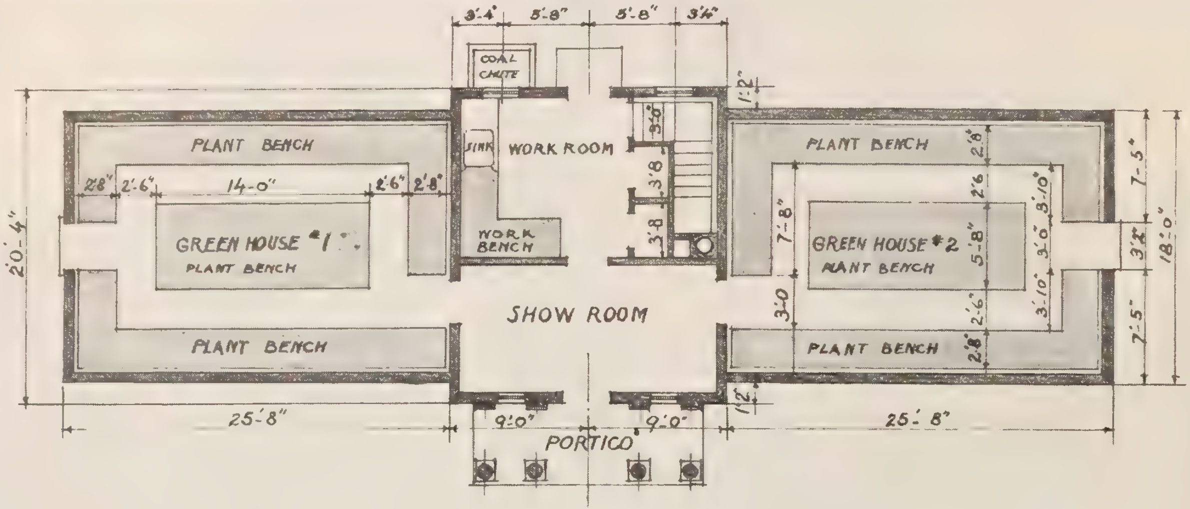
are most economical where piling must be unusually long. The highly perfected joint develops over 80% of the strength of the wood section, and also insures the most exact, straight alignment in driving. The spirally reinforced steel shell section is left in the ground.

RAYMOND CONCRETE PILE COMPANY

NEW YORK: 140 Cedar Street
CHICAGO: 111 West Monroe Street
MONTREAL, CANADA

Branch Offices in Principal Cities

"A Form for Every Pile—A Pile for Every Purpose"



Central Work Room With Flanking Greenhouses

Erected for Mr. Julius Fleishmann, Port Washington, L. I.—James W. O'Connor of New York, Architect

ADMITTEDLY, such a subject has its distinct advantage as to plan and appearance. However, don't lose sight of the fact that with the usual desirable east and west location, the work room will shade a portion of the west house from the early morning light in which there is the greatest growing qualities. Do not plan that house for roses.

Of course the central location of the work room makes both houses handy, and gives an even distribution of heat from the boiler in its cellar.

The Show Room was a sensible idea of the owners. It not alone gives a place where the best of the growing plants and flowers can be displayed, but makes the greenhouse accessible without the usual approach through the work room.

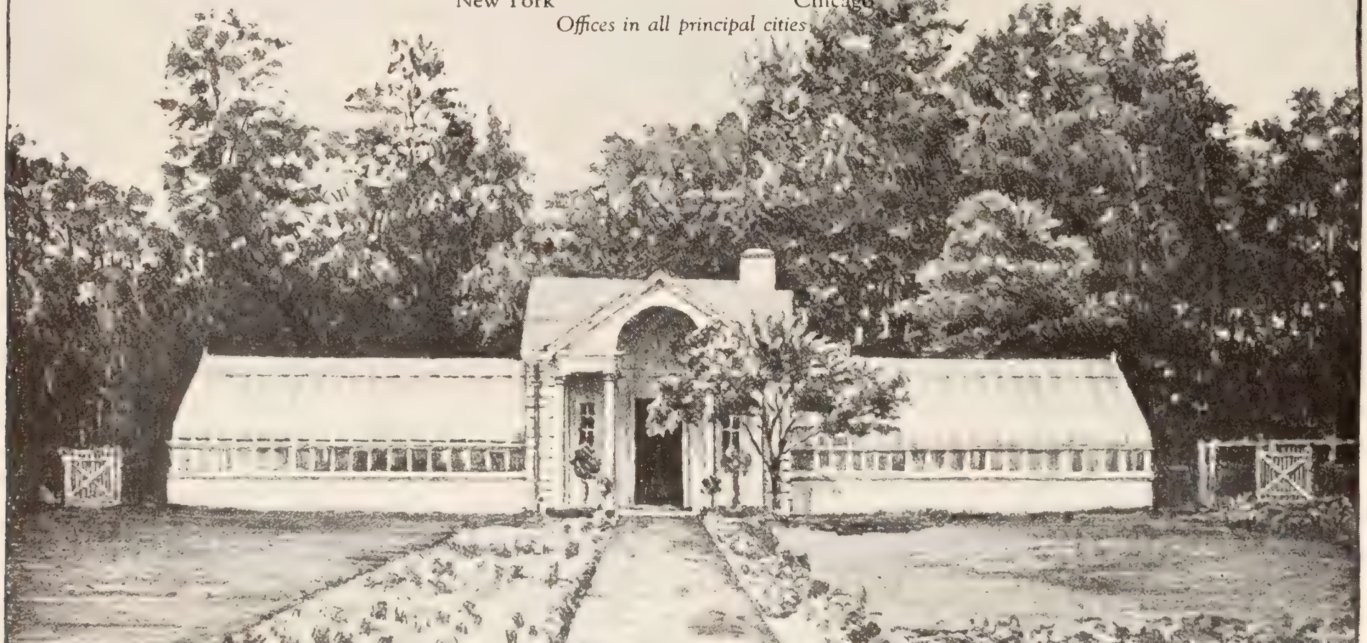
This is Number Nine of a series of studies, each done in lithograph by Vahan Hagopian. Every six months, reprints of the preceding studies will be mailed to all who send their names.

Lord & Burnham Co.

30 East 42nd Street
New York

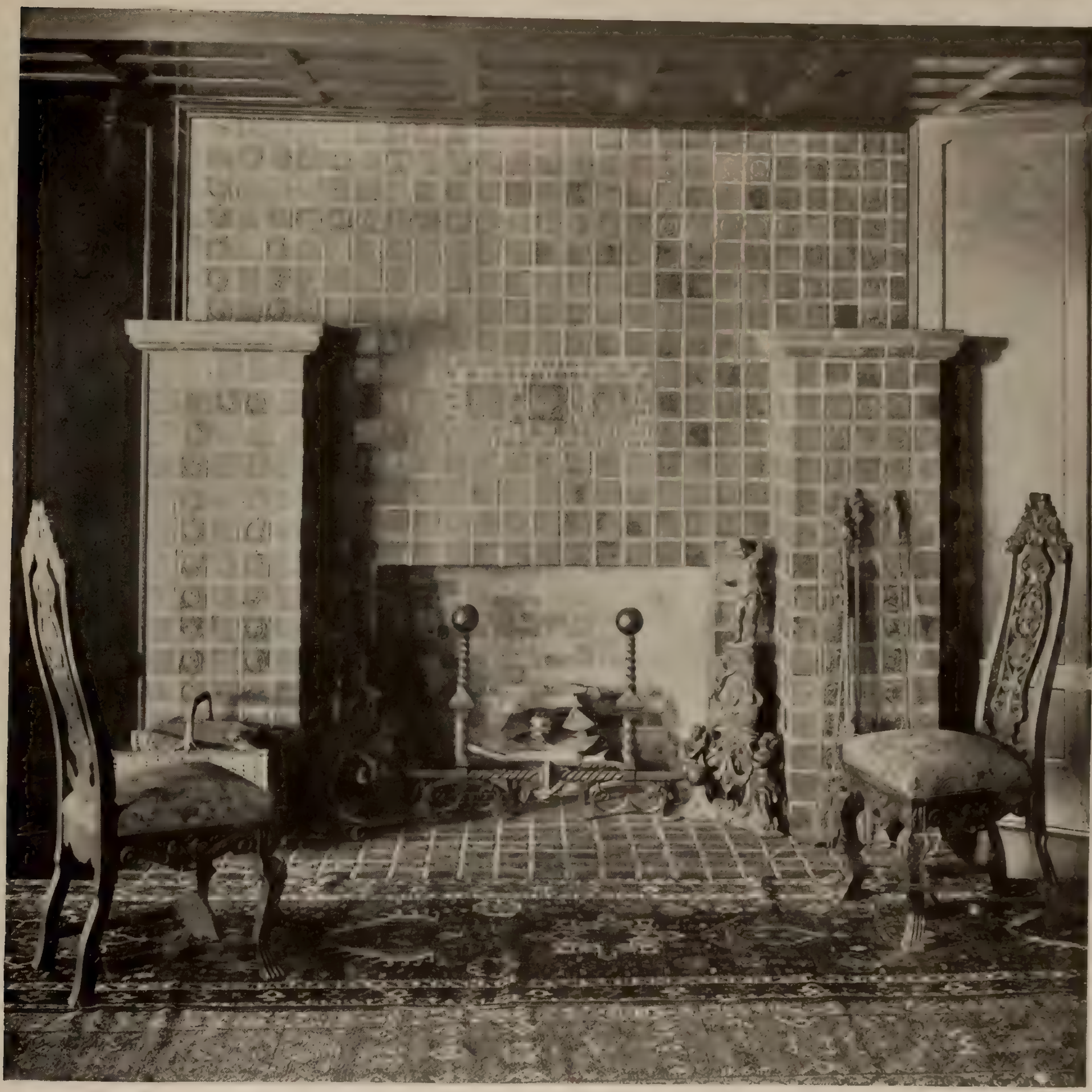
Continental Bank Bldg.
Chicago

Offices in all principal cities



GLASS ENCLOSURE STUDIES - PLATE No. 9

BATCHELDER TILES



[—an example of the co-operation of our Service Department in the solution of a decorative problem through the use of stock materials of a simple type.]

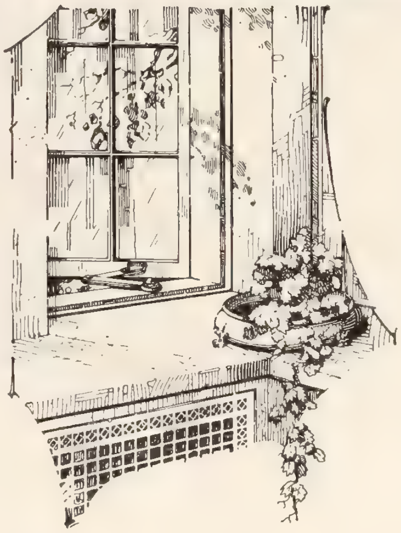
IT is "real fun" to work with Batchelder Tiles....they are eloquently expressive of the artistic, and are remarkably versatile, too....adaptable to any architectural motif, any decorative scheme. The results achieved bring the satisfaction of having created a thing of distinction.

Soft, rich colorings....contrasting glazes and textures...beautiful designs, many and varied....truly a delightful means to splendid results.

Tiles for fountains, mantels, pavements, bathrooms, wainscotings.

See Sweet's Catalogue or write for complete information.

BATCHELDER-WILSON COMPANY
2633 Artesian Street, Los Angeles
101 Park Avenue, New York City



THE cozy corner in the living room illustrated above is a splendid representation of solid comfort. The whole setting from the quiet mellow tones of the gray walls to the colorful drapes and the deep-piled rugs, lend a feeling of restfulness and contentment.

Here too the casements play an important part for without them such cheerfulness could never be obtained. They admit warm playful sunbeams and refreshing summer breezes and also defy, through interlocking construction, the intruding blasts of winter.

The Kawneer Solid Nickel Silver Windows shown above are adaptable to any building where durability and positive weathering are desired.

THE friction adjuster featured in the pen and ink sketch above is applied to all Kawneer casements. It will hold the sash at any desired angle and without the usual adjustment of thumb screws, etc. They are made of Kawneer Nickel Silver.

Information pertaining to Windows or Store Fronts will be gladly furnished.

THE
Kawneer
COMPANY
NILES, MICHIGAN

SEE OUR
CATALOGUE
IN
SWEET'S

A Profitable Investment for any home

THE Minneapolis Heat Regulator is a profitable investment for any home, large or small. No heating plant can reach its greatest efficiency without automatic heat regulation. But automatic control falls far short of its goal unless the regulation is dependably accurate and is the clock type so as to shut down the fire automatically at night and raise the temperature automatically in the morning.

The Minneapolis Model 77 is a clock regulator that has proved its dependable accuracy. It is the perfected product of forty years of nation-wide service.

Write us for catalog made to fit your files.

MINNEAPOLIS HEAT REGULATOR CO.
Established 1885
406 EAST 28TH ST., MINNEAPOLIS, MINN.

Factory Service Branches in principal cities render complete installation service. Elsewhere specify installation by the heating contractor.

The "MINNEAPOLIS" HEAT REGULATOR
FOR COAL—GAS—OIL

Kenosha County Court House
Kenosha, Wisconsin

Lindl-Lesser & Schutte
Architects

METAL DOORS AND TRIM

COMPLETE ELEVATOR INCLOSURES AND CABS

UNI-TRE FRAMES

ADJUSTABLE PARTITIONS

CONDUO-BASE

DAHLSTROM Metal Doors, specially designed and constructed, provide an appropriate entrance to this stately court house.

Dahlstrom products are the generally accepted standard for installation in the best type of commercial and public buildings.

We shall be pleased to put your name on our list to receive our architectural literature.

DAHLSTROM

DAHLSTROM METALLIC DOOR COMPANY
INCORPORATED 1904
JAMESTOWN, NEW YORK

NEW YORK - 25 Broadway · CHICAGO - 19 So. LaSalle Street · DETROIT - 1331 Dime Bank Bldg.

Threading

"Central Black" and "Central White" Conduit

There is the same care and accuracy in threading "Central" Conduit as in every operation in the "Central" plant.

ARCHITECTS, aware of the importance of accurate, clean-cut conduit threads, will find interesting the "Central" threading process here illustrated and described.

AFTER being cut into 10-foot lengths, as illustrated at the right, a large lift of plain end pipe in conduit lengths is placed on the rack, shown at the right of the above picture. The operator in the rear takes a length and threads one end. He then passes it to the operator in the foreground, who threads the other end and passes the length to the rack shown at the right of the picture.

Great care is exercised in the threading of "Central" Conduit. All machines are kept in perfect condition, and chasers are changed and sharpened at regular intervals, to insure clean, smooth threads.

Before "Central" Conduit is threaded the pipe is machine cut into 10-foot lengths.

Standard gages are used continually to insure correct thread sizes.

The length of the thread is controlled in the machine, and is watched carefully, so that all threads are of the same length on the respective sizes.

All pipe is reamed during the threading operation, which removes the fin or projection caused by the cutting.

CENTRAL TUBE COMPANY

GENERAL OFFICES ~ FIRST NATIONAL BANK BUILDING
PITTSBURGH
DISTRIBUTORS IN ALL LARGE CITIES

CORROSION—the Cancer of Metal

CORROSION! Rust! The incurable and malignant malady which day and night, unceasingly, is eating away the life of the pipe in your home. Your first warning of its deadly work is a sudden leak. Then comes a ruined ceiling or floor. A plumber's bill, a plasterer's or carpenter's bill. Trouble, annoyance and expense!

Corrosion "strikes" without the slightest warning.

The accompanying picture, drawn from an actual photograph, shows what corrosion can do to steel pipe. But you notice that the coupling is still as good as the day it was installed. That coupling is made of Genuine Wrought Iron!

When building or refitting, specify Reading Genuine Wrought Iron Pipe—the pipe that endures. No other metal compares with the best wrought iron for economy, combined with rust-resisting qualities. True, there is cheaper pipe, but none more *economical* than "Reading." Figured on a cost per year basis, a supreme quality of wrought iron is far and away the least expensive pipe you can buy.

READING IRON COMPANY
READING, PA.

World's Largest Manufacturers of Genuine Wrought Iron Pipe

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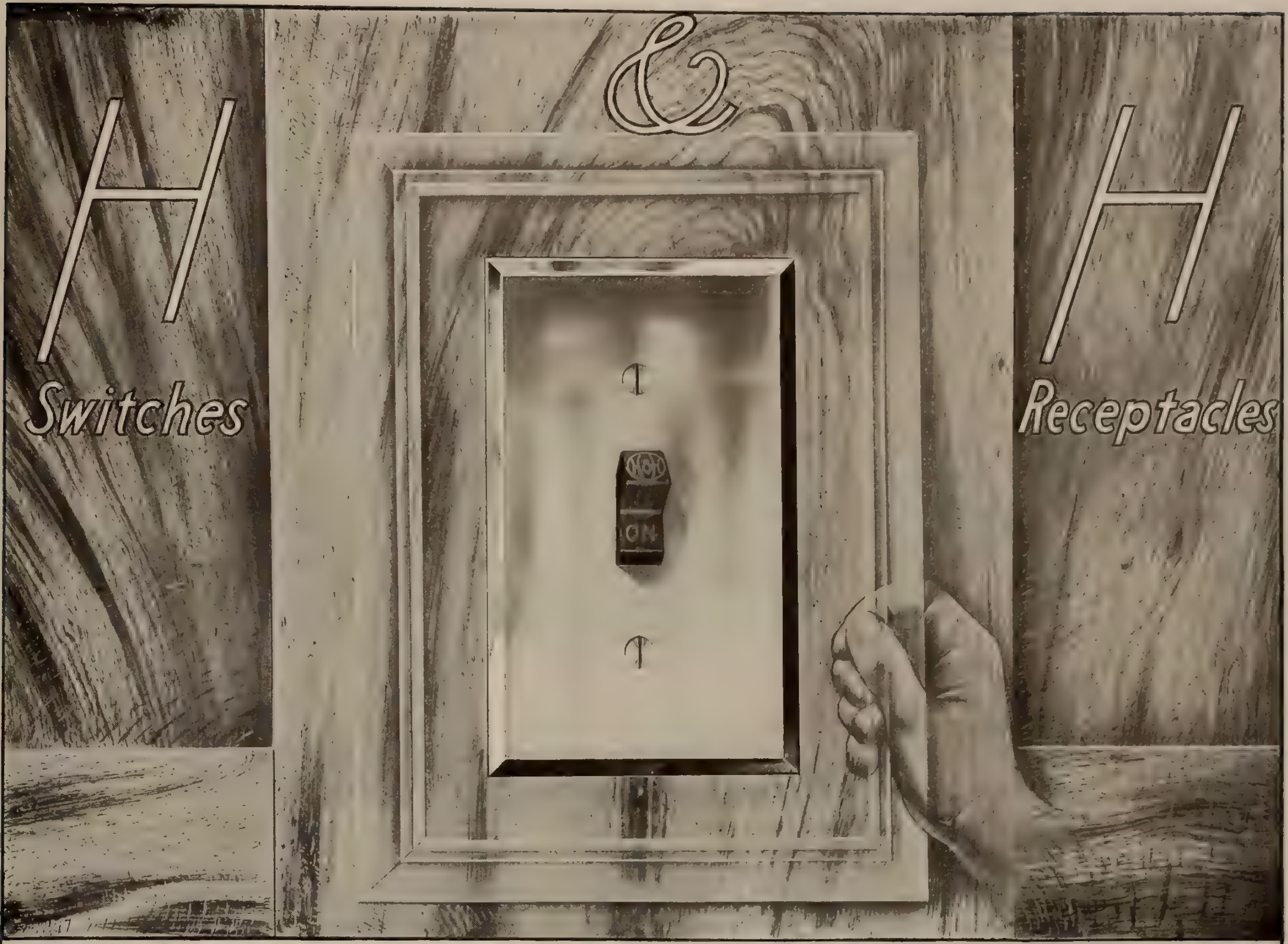
READING PIPE

GENUINE WROUGHT IRON



Highlight and Hall-mark of your Electrical Work

HERE again the fact stands out that a fine switch is a focal point in the decorative scheme.

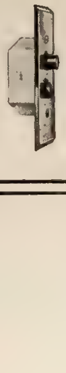
Style on the outside; Balance inside, the new Square Handle Tumbler seems a happy accessory of master designing.

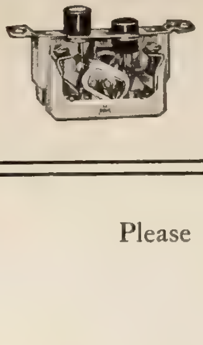
The touch confirms the impression of quality throughout, for back of the handle is the *balanced movement* of the famous "8601" (round handle) Tumbler.

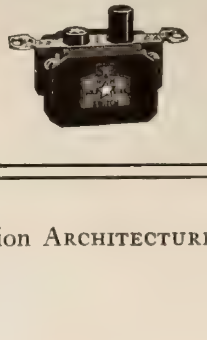
The smoothest, most quiet and pleasing action yet sensed in a tumbler, it suggests more of art than mechanics.

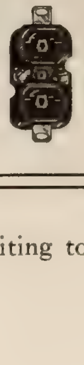
Of Shallow Tumblers, the most durable mechanically; the most positive electrically—and withal, competitive-priced! In looks, *exclusive*. In cost, so "popular" that any or every job can include it. So as not to confuse with the round-handle style, specify "8601 *Square*."

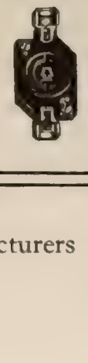
THE HART & HEGEMAN MFG. CO. HARTFORD, CONN.

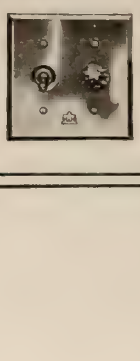












Keep Right On Building This Winter

Bears and ground hogs still hibernate. But engineers, architects, contractors and building owners don't let winter drive them to cover.

They know that "time is money"— that winter is just as good as any other time to build; so they keep on building in cold weather.

The building industry, as well as the public, recognizes that this practice is not only practical but usually profitable for all concerned.

Winter construction means that builders can continue their work without interruption through twelve months. The builder's crew, which has been trained to maximum efficiency, can be kept intact and steadily employed with profit to everyone.

Winter construction by providing quicker occupancy, brings to the owner an earlier return on his investment.

During the winter there are few delays in getting material. Sand and stone are usually nearby; cement is obtainable on short notice practically anywhere. And these materials come to you ready for use—you make your building right on the job.

In winter, as in summer, concrete is the last word in speed of construction—the champion time saver.

If you have not yet experienced the advantages of winter building, plan now to do so.

And remember, where "time is money" use concrete.

* * *

The few fundamental principles of cold weather construction are simple and easy to apply. If you are not familiar with them, ask our nearest District Office for literature on winter building. There is no obligation.

PORTLAND CEMENT ASSOCIATION

A National Organization to Improve and Extend the Uses of Concrete

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Boston
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Denver
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Residence of J. H. Carstairs, Esq., Ardmore, Penna. *John Russell Pope, Architect*

THREE TIMES

the Heating Surface of the Ordinary Furnace

Naturally Enough the Kelsey SAVES COAL!

The Kelsey Warm Air Generator has three times as much heating surface as the ordinary heater.

All sides of the Kelsey zig-zag tubes, that form the fire-pot and combustion chamber, are in *direct contact* with the burning gases. The fresh air from outdoors comes into these tubes, is warmed with a minimum amount of coal, and forced all through the house. Practically no heat goes up the chimney.

This shows Kelsey Warm Air Generator with part of casing removed. Notice long fire travel and how hot gases heat backs of zig-zag tubes before passing into smoke pipe. In the Kelsey every available heat unit is utilized.

Write for copy of "Kelsey Achievements."
It is full of helpful heating information.
You will be glad to keep it on file.

Sales Offices
Boston and New York

THE KELSEY
WARM AIR GENERATOR
(Trade Mark Reg. U. S. Pat. Off.)
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Dealers
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LET IT RAIN

Zinc is always ready for rain. It cannot rust. Zinc roofing equipment is permanent protection against the elements; heat or cold, rain or snow do not affect it. It will last a lifetime without repair. And it is not expensive. The cost of Horse Head Zinc, figured on the basis of its long life and its freedom from expense either for repair or replacement, is lower than that of any other metal.

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Established 1848
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HERE are the countless advantages of Slate—strong, tough, permanent, sanitary, fireproof, economical—and in any color or design desired.

Struco Slate is strong, everlasting Natural Slate with a durable, permanent finish in Any Color—a finish that will not chip, crack or discolor—a finish that resists acids, withstands wear and can be kept clean with little effort—a finish in ANY COLOR or COMBINATION OF COLORS.

Use Struco Slate in your future Shower Stalls, Toilet Enclosures, Urinal Stalls, Wainscots, etc.

Samples of Struco Slate in various colors are available. We'll be glad to send them to interested architects.

STRUCO SLATE

Manufactured by

THE STRUCTURAL SLATE COMPANY

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Beautiful Milbrook-in-Greenwich

100 per cent Kernerator Equipped

NEITHER garbage can nor rubbish heap will ever mar the beauty of Milbrook-in-Greenwich. For the Milbrook Holding Company, which conceived and developed the project, insists that the time-tried Kernerator be built into every home.

Each of these two-hundred-odd beautiful residences, costing from $25,000 to $50,000, will thus have permanent, complete, instant means of waste disposal.

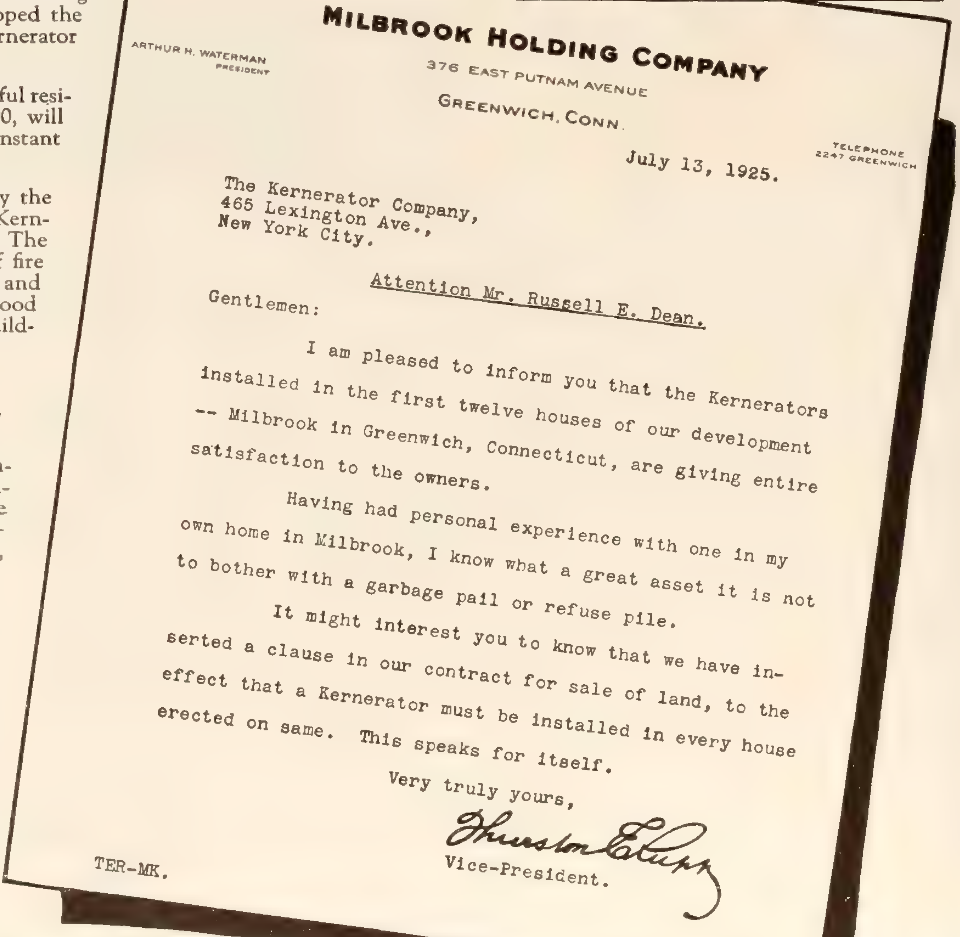
Architect, builder and realtor profit by the contentment of owner or tenant in the Kernerator-equipped house or apartment. The countless steps saved, the reduction of fire hazard, the new neatness of house and yard—all contribute greatly to the good will which is so potent a factor in building a permament business.

Costs Nothing to Operate— No Commercial Fuel Used

The Kernerator consists of a brick combustion chamber at the base of the chimney, with hopper doors in the flue above (in or near the kitchen). *All* waste—garbage, sweepings, tin cans, bottles, papers, magazines, wilted flowers, cigar and cigaret stubs, even razor blades—dropped into hopper door, falls to the combustion chamber. An occasional lighting (it lights easily) is all that is necessary—the waste itself is fuel for its own destruction. Non-combustibles (tin cans and the like) are flame-sterilized for removal with the ashes.

For additional data, consult Sweet's (1925), pages 2800-01, or communicate with—

KERNER INCINERATOR CO.
711 East Water St., Milwaukee, Wis.



MILBROOK HOLDING COMPANY
376 EAST PUTNAM AVENUE
GREENWICH, CONN.

ARTHUR H. WATERMAN
PRESIDENT

TELEPHONE
2247 GREENWICH

July 13, 1925.

The Kernerator Company,
465 Lexington Ave.,
New York City.

Attention Mr. Russell E. Dean.

Gentlemen:

I am pleased to inform you that the Kernerators installed in the first twelve houses of our development -- Milbrook in Greenwich, Connecticut, are giving entire satisfaction to the owners.

Having had personal experience with one in my own home in Milbrook, I know what a great asset it is not to bother with a garbage pail or refuse pile.

It might interest you to know that we have inserted a clause in our contract for sale of land, to the effect that a Kernerator must be installed in every house erected on same. This speaks for itself.

Very truly yours,

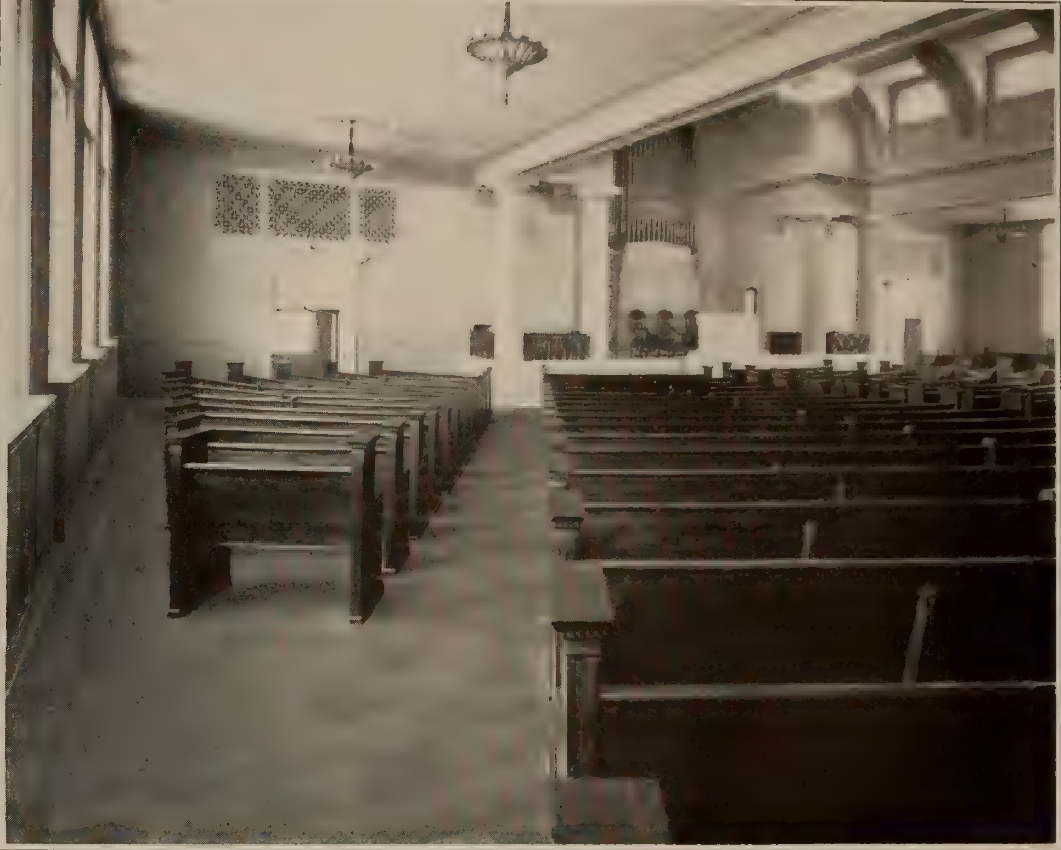
Vice-President.

TER-MK.

KERNERATOR
Built-in-the-Chimney
Reg. U. S. Patent Office

The Kernerator costs no more to build in than the price of a good radio set. But it cannot be installed *later*, while the radio can be added any time — a thought to leave with the client.

Armstrong's Cork Tile Floors from Coast to Coast



The First Church of Christ Scientist, situated at Arthur and Detroit Avenues, Lakewood, Ohio. This beautiful building is floored with Armstrong's Cork Tile—a field of 12" x 12" light shade with border of 2" dark and 3" light. A noiseless, warm and comfortable floor that is easily cleaned and shows no wear.

Along the Lake Shore—

Other Installations of Interest

- Borton & Borton, Hanna Bldg., Cleveland.
- City of Cleveland Heights Hall.
- Cleveland Athletic Club, Dining Room.
- Scioto Valley Supply Co., Canton, Ohio.
- First U. P. Church, Canton, Ohio.
- First M. E. Church, Elyria, Ohio
- Diamond Portland Cement Co., Williamson Bldg., Cleveland.
- Stowe Fuller Company, Union Trust Bldg., Cleveland.
- Ashtabula Telephone Co., Ashtabula, Ohio.
- Austin Powder Co., Union Trust Bldg., Cleveland.
- The Maher-Collieries Co., Union Trust Bldg., Cleveland.
- John Gill & Sons, Bulkley Bldg., Cleveland.
- Bulkley, Hauxhurst, Jamison & Sharp, Bulkley Bldg., Cleveland.

THE residential suburbs along the shores of the Great Lakes are especially notable for their high type of buildings and the discrimination shown in the choice of building materials.

Take floors for example. Where beauty of design must combine with comfort and quietness underfoot, with durability and ease of cleaning, the preference is decidedly for Armstrong's Cork Tile. In churches, libraries, banks, and offices, this soft-toned floor of resilient, sound-absorbing cork meets every requirement from the standpoints of artistic appearance, comfort, low cost of upkeep, and long life in service. It is warm, silent, nonslippery, easy to clean, and needs no polishing, waxing, or varnishing.

As a church or library floor, Armstrong's Cork Tile is unequalled.

A 32-page book, "Armstrong's Cork Tile Floors," illustrated in color and containing complete specifications will be sent on request with a sample tile.

ARMSTRONG CORK & INSULATION COMPANY
Division of Armstrong Cork Company
160 TWENTY-FOURTH STREET, PITTSBURGH, PA.
Also manufacturers of Linotile Floors

Armstrong's Cork Tile

A dog tells about Pondosa Pine

A whimsical notion, no doubt, but a mighty interesting story of Pondosa Pine and the Inland Empire of the Great Northwest, whence it comes. "Bingo of Flathead" is the title of this little book, which we will mail you on request. You may already know that every trade-marked stick of Pondosa Pine is rigidly *graded,* thoroughly *seasoned* and carefully *milled,* but you ought to hear "Bingo" tell about it. Address Dept. 26, Western Pine Manufacturers Association of Portland, Oregon.

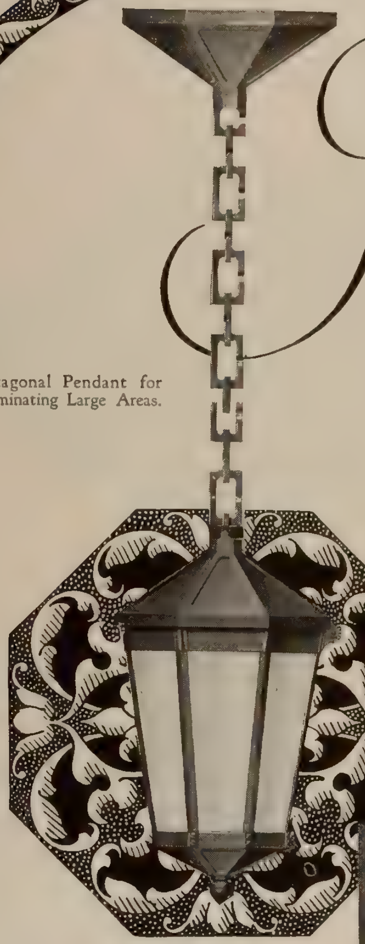
Pondosa Pine

The Pick o' the Pines

Bingo of Flathead
—A dog's story of Pondosa the Pick o the Pines

Write for this booklet

Brilliance



Octagonal Pendant for Illuminating Large Areas.

LIGHT may be overwhelmingly strong in its intensity. Or it may be broken up, brilliant. And in both cases the quantity of light could be the same.

The special glassware used in the Octagonal Pendant produces this "live" effect. The light is sparkling and scintillating like a cluster of diamonds.

This kind of light is particularly desirable in the entrance ways of public and semi-public buildings. Here people meet and congregate. The vivacity of the light promotes a feeling of friendliness, adding gaiety to the occasion.

Bracket suspension can be used with the Octagonal Pendant, if desired.

Years of experience with illumination problems of all kinds are placed at your disposal through the Westinghouse Illuminating Engineering Bureau. Are you using it?

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
GEORGE CUTTER WORKS SOUTH BEND, IND.
Sales Offices in all Principal Cities of the United States and Foreign Countries

Entrance to Centre Market, Newark, N. J., Grad and Hooper, Architects.

Westinghouse

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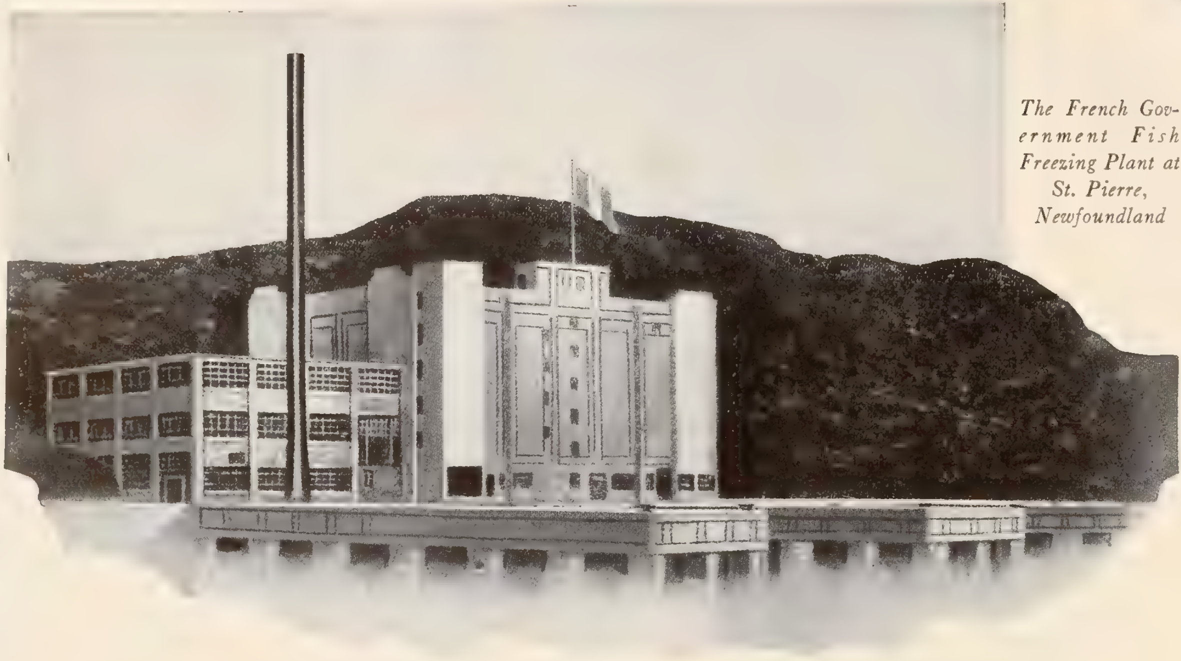


The French Government Fish Freezing Plant at St. Pierre, Newfoundland

"Where the fish get a Cool Reception!"

THE waters around the coast of Newfoundland are considered right cool—but in retrospect, they are like the baths of Baden-Baden to fish who gain admission to the French Government Fish Freezing Plant, at St. Pierre.

The atmosphere behind the Jamison-made portals of this French fishery would give an Eskimo chilblains.

But here, amid the most grueling conditions that a cold storage door must meet, 33 Jamison Sharp Freezer Doors and 3 Jamison Ice Chutes have *more* than held their own for years.

We have countless testimonials to convince any architect who deals with refrigerating problems that the name "Jamison" is worthy of a place in any list of specifications for cold storage door equipment.

Better Doors *mean* Better Refrigeration

OF all cold storage doors sold, more than half are Jamisons. Our list of customers, over 17,000 long, includes the largest operators on every continent.

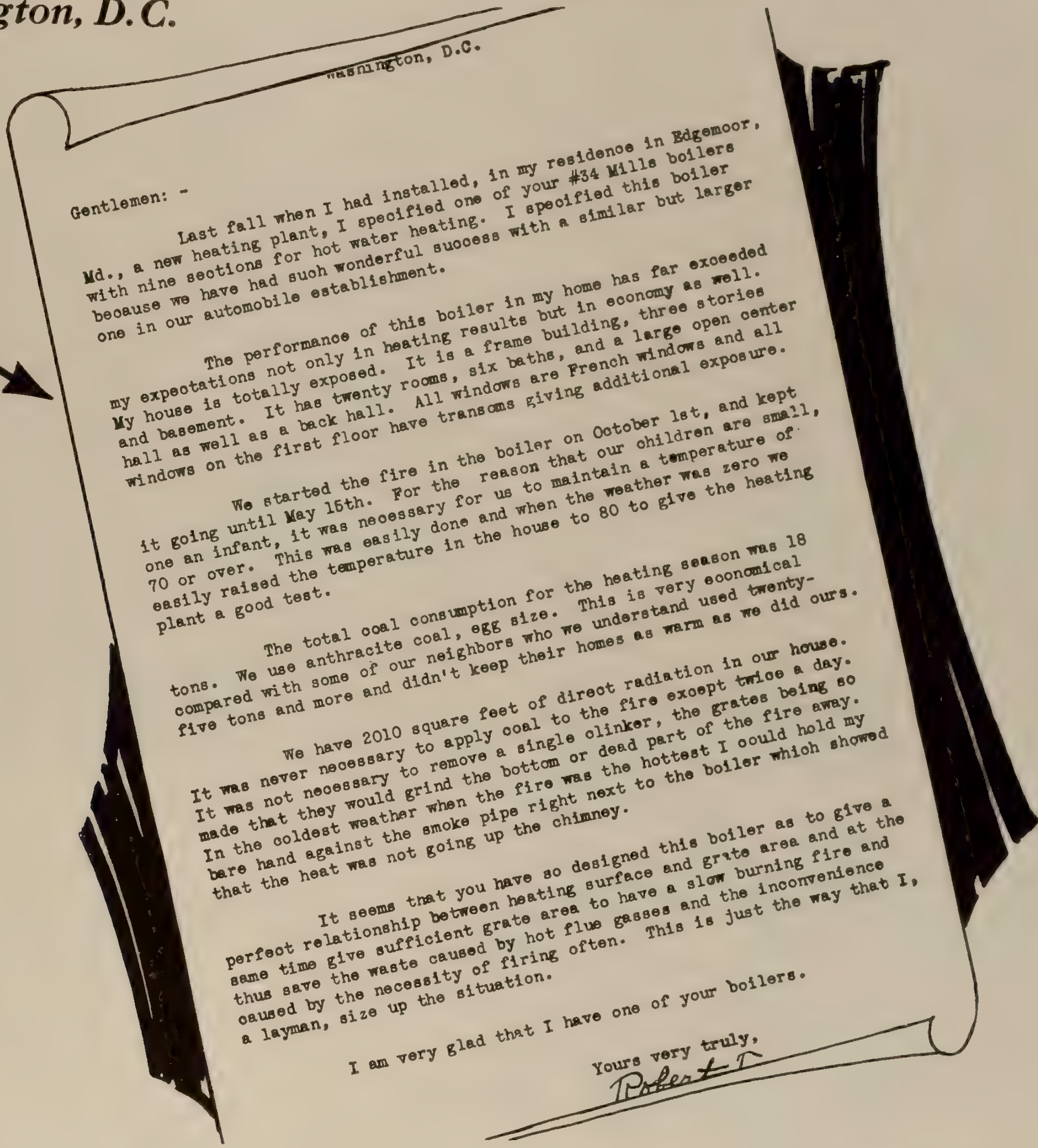
Our catalog, describing the complete list of Jamison Products and illustrating details of construction, will be sent to any interested architect, on request.

Jamison Doors

Jamison Cold Storage Door Company
Hagerstown, Maryland, U. S. A.

"—far exceeded my expectations not only in heating results but in economy--"

Washington, D.C.



Washington, D.C.

Gentlemen: -

Last fall when I had installed, in my residence in Edgemoor, Md., a new heating plant, I specified one of your #34 Mills boilers with nine sections for hot water heating. I specified this boiler because we have had such wonderful success with a similar but larger one in our automobile establishment.

The performance of this boiler in my home has far exceeded my expectations not only in heating results but in economy as well. My house is totally exposed. It is a frame building, three stories and basement. It has twenty rooms, six baths, and a large open center hall as well as a back hall. All windows are French windows and all windows on the first floor have transoms giving additional exposure.

We started the fire in the boiler on October 1st, and kept it going until May 15th. For the reason that our children are small, one an infant, it was necessary for us to maintain a temperature of 70 or over. This was easily done and when the weather was zero we easily raised the temperature in the house to 80 to give the heating plant a good test.

The total coal consumption for the heating season was 18 tons. We use anthracite coal, egg size. This is very economical compared with some of our neighbors who we understand used twenty-five tons and more and didn't keep their homes as warm as we did ours.

We have 2010 square feet of direct radiation in our house. It was never necessary to apply coal to the fire except twice a day. It was not necessary to remove a single clinker, the grates being so made that they would grind the bottom or dead part of the fire away. In the coldest weather when the fire was the hottest I could hold my bare hand against the smoke pipe right next to the boiler which showed that the heat was not going up the chimney.

It seems that you have so designed this boiler as to give a perfect relationship between heating surface and grate area and at the same time give sufficient grate area to have a slow burning fire and thus save the waste caused by hot flue gasses and the inconvenience caused by the necessity of firing often. This is just the way that I, a layman, size up the situation.

I am very glad that I have one of your boilers.

Yours very truly,

Robert T

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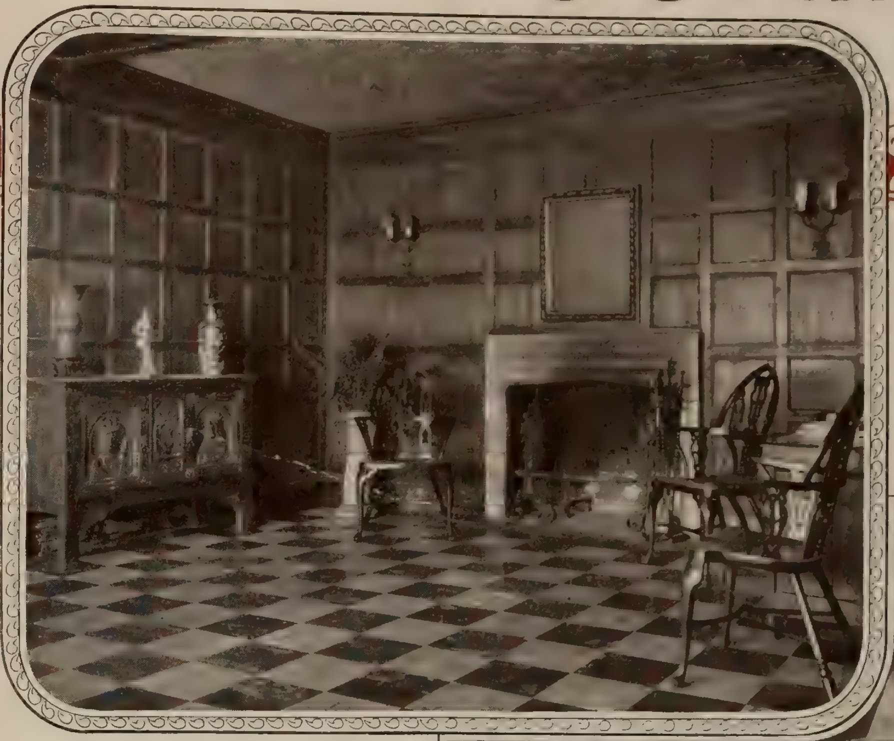

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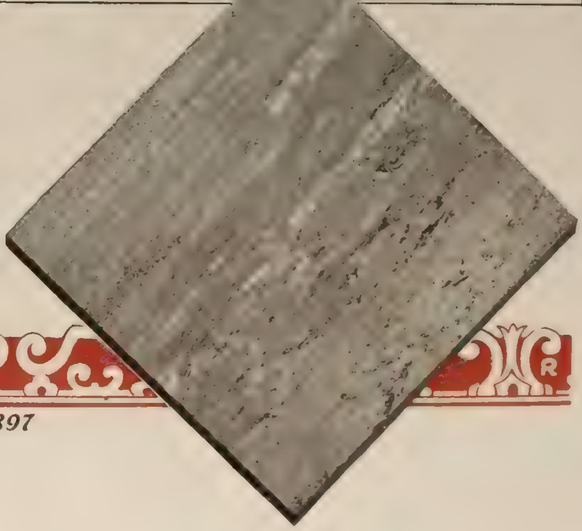

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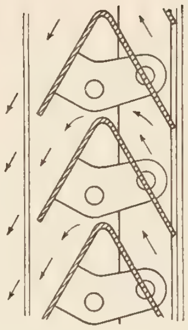

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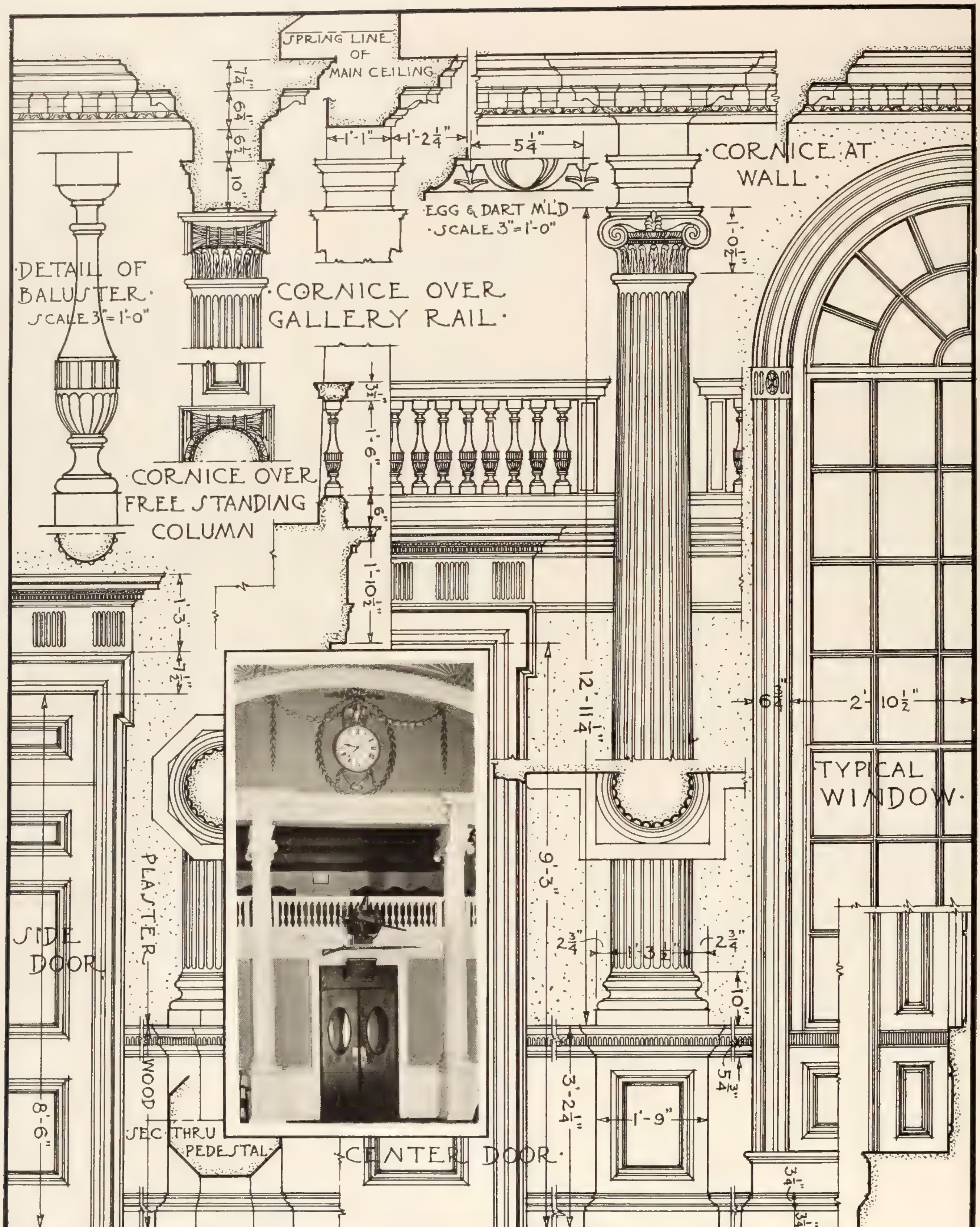

- SCALE THREE-QUARTER INCH = ONE FOOT -

- DETAILS OF ORIGINAL SENATE CHAMBER -

- MASSACHUSETTS STATE CAPITOL BUILDING - - BOSTON -

- COMPLETED 1798 - - CHARLES BULFINCH - ARCHITECT -

- MEASURED & DRAWN BY GEORGE - R - MITCHELL -

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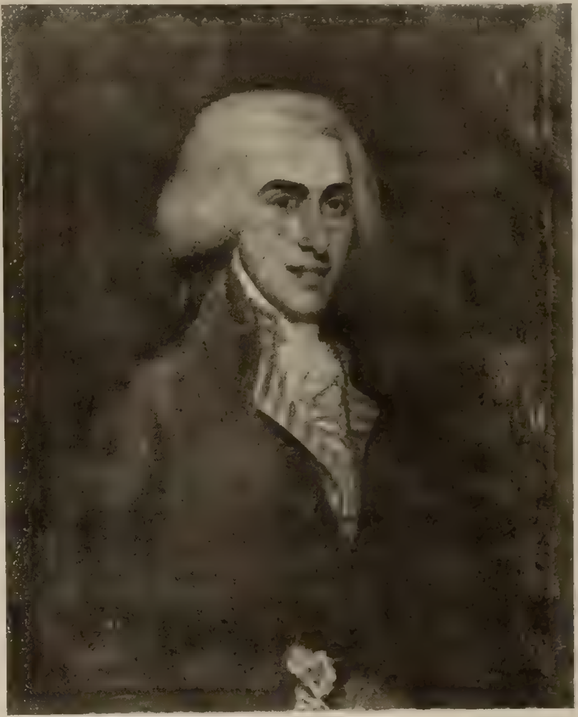
Published by Charles Scribner's Sons
THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. LII DECEMBER, 1925 NO. 6

Charles Bulfinch, the First American Architect

By M. A. S. Shannon

THE American Wing of the Metropolitan Museum, with its comprehensive and fascinating collection of early architectural interiors, and the skilled craftsmanship displayed in their furnishings, will do much to quicken interest in a subject intensely national in its scope.

Its educational value can hardly be estimated, for it will afford an opportunity to study, at first hand, the beginnings and later development of our architecture and art crafts. There is undoubtedly abundant need of enlightenment in this respect. People in general know comparatively little about the whole subject, and are in the habit of lumping together everything built in this country, before the first quarter of the nineteenth century, under the head of Colonial architecture.



Portrait of Charles Bulfinch, Painted in London in 1786. (Loaned by the Bulfinch family to the Massachusetts Historical Society.)

The term has been stretched to cover the whole period of two centuries, from 1620 to 1820.

In its original and natural sense, Colonial applies to architecture before the Revolution. The great point of division in American history, as in its arts and culture, is the Revolution. The two fundamental periods into which it divides may be properly called the Colonial and the Federal, or National, dating from the days of the new republic to the second decade of the nineteenth century.

The necessary distinctions within the Colonial period, between the work with renaissance forms in the eighteenth century and the essentially mediæval work of the seventeenth century, may best be made by the use of the century names themselves. In the American Wing the different periods represented are thus designated. The terms Georgian and Jacobean, frequently used in connection with Colonial architecture, have limited and artificial meanings and are likely to confuse the uninitiated. The evident aim of the Museum administration has been to simplify as far as possible. Great pains have been taken to secure historical accuracy in the equipment and furnishing of the rooms, and a chronological sequence is the only concession to the scientific side.

It is surprising, in view of the study already devoted to individual buildings, how little has yet been done to trace the course of development through which different features passed during the long period of their use. We know the successive changes which the Gothic flying buttress underwent, as the result of experiment, far better than we know the similar changes through which Colonial motives, such as doorways or interior panelling, passed in the course of study by generations of craftsmen. The opportunity afforded by the American Wing to study the development of woodwork chronologically cannot fail to produce greater intelligence and sympathy in modern designing in similar forms.

Moreover, respect for the fathers will be duly augmented by acquaintance with the serene and handsome environment to which they were accustomed. The luxury in which they indulged was controlled by a fastidious taste for refined simplicity, that presents a striking contrast to modern exotic interiors, hot and heavy as over-decorated playhouses.

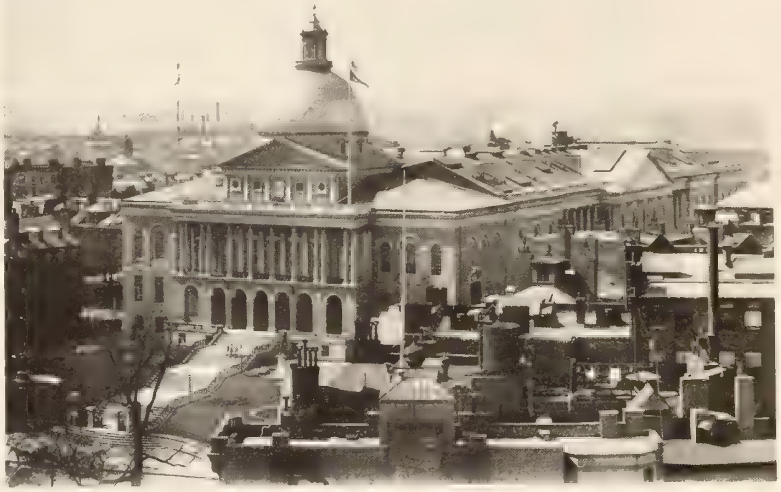
A city or a nation should represent in its art, itself, its people, its industries, its life; and should do so sincerely and sanely.

Probably there is no period in our country's history of which this is more the case than in the prosperous years immediately following the adoption of the Federal Constitution by the fifteen States. The twofold readjustment from a war to a peace basis and from a colonial to an independent form of government naturally occasioned no little disturbance and hardship. The men of Boston who had taken the lead in the fight for independence now stood squarely on the side of a political system whose soundness and wisdom assured national stability and union. Their next step was to set themselves with a grim determination to the hard task of redeeming their losses and restoring prosperity at home. Boston was practically rebuilt, between 1790 and 1815, in a distinctive style of Federal architecture of which Charles Bulfinch was the originator and chief exponent. He and his school gave to Boston a distinction that even the imitators of Renaissance, Gothic, and French Renaissance have been unable wholly to efface.

With the new era of prosperity, there came a marked change in the tone and manners of the community. The simpler tastes of provincial times gave place to a desire for a more ambitious style of living.

The successful merchants of federated Boston sought to perpetuate their names and glorify their city by mansions, churches, and public buildings of a new kind of magnificence. Society was quite as aristocratic as that of Philadelphia or London. It differed from that of Salem as the graceful curves of Bulfinch's dining-rooms and spiral staircases differ from the austerity of McIntire's interiors. Bulfinch himself was a product of this new social order. He possessed every advantage of birth, education, and wealth. The son and grandson of eminent physicians, he graduated at Harvard in 1781, and made the usual finishing trip to Europe when he was twenty-one.

It was a critical moment in the history of American architecture, but by a singular good fortune it was precisely at this point that young Bulfinch decided to adopt for the first time in New England the unrecognized profession of architecture. Christopher Wren is said to have slipped into architecture "over the wall," so to speak, like Bunyan's "Formalist and Hypocrisy," his early life being devoted to science rather than to art. So with Bulfinch, who planned to follow his father's profession. During his travels, however, the splendid examples of European architecture which he saw aroused his enthusiasm and quickened his latent powers into life. Thomas Jefferson was ambassador at the Court of France, and Bulfinch had letters of introduction to him. Jefferson's remarkable knowledge of architectural principles had brought him in contact with the French architect, Clerisseau, and the Scotchman, Robert Adam. Jefferson took a personal interest in Bulfinch and advised him to extend his travels to Italy, where he visited Rome, Florence, and Siena.



View of the Boston State House, from an elevation before the addition of the marble wings in 1914.

The first important commission that came to young Bulfinch after his return to Boston in 1786 was to design the first solid block of residences in New England, the Tontine Crescent, in Franklin Place.

Bulfinch may have seen a design for one of these crescents by the Adam brothers, who taught him his sense of proportion, but none had yet been built when Bulfinch visited England. His handling of the difficult problem was masterly. His plan for the sixteen three-story brick houses attained uniformity without tiresome repetitions. The entrances were grouped by twos, the end groups advanced six feet beyond the others, and adorned by pilasters. The oval in front had a grass plot in the centre, with a classic urn in memory of Franklin, who had recently died.

Bulfinch also designed a new form of detached mansion on Beacon Hill, where residences were springing up on the new streets laid out on the sunny slope of Copley's Pasture.

One of the finest of these authentic Bulfinch houses is No. 85 Mt. Vernon Street, owned by Mr. Richard Sears. Gray paint conceals the soft tone of the hand-made bricks, laid in Flemish bond, to break joints neatly and give variety to the surface. The string course, a band of freestone running across the house above the first story, which effectively holds together the sills and entablatures of the same material, is a favorite device with Bulfinch. A charming elegance is afforded the square walls by the shallow recesses of brick within which are set the windows of the first story. Pilasters rise from the second story to the balustraded roof.

Bulfinch frequently relieved the square mass of Georgian tradition by a bow on the ground story, making place for an elliptical dining-room, as in the Governor Gore mansion still standing in Waltham, Massachusetts. His later city houses gained light and distinction by a double bow or swell front.

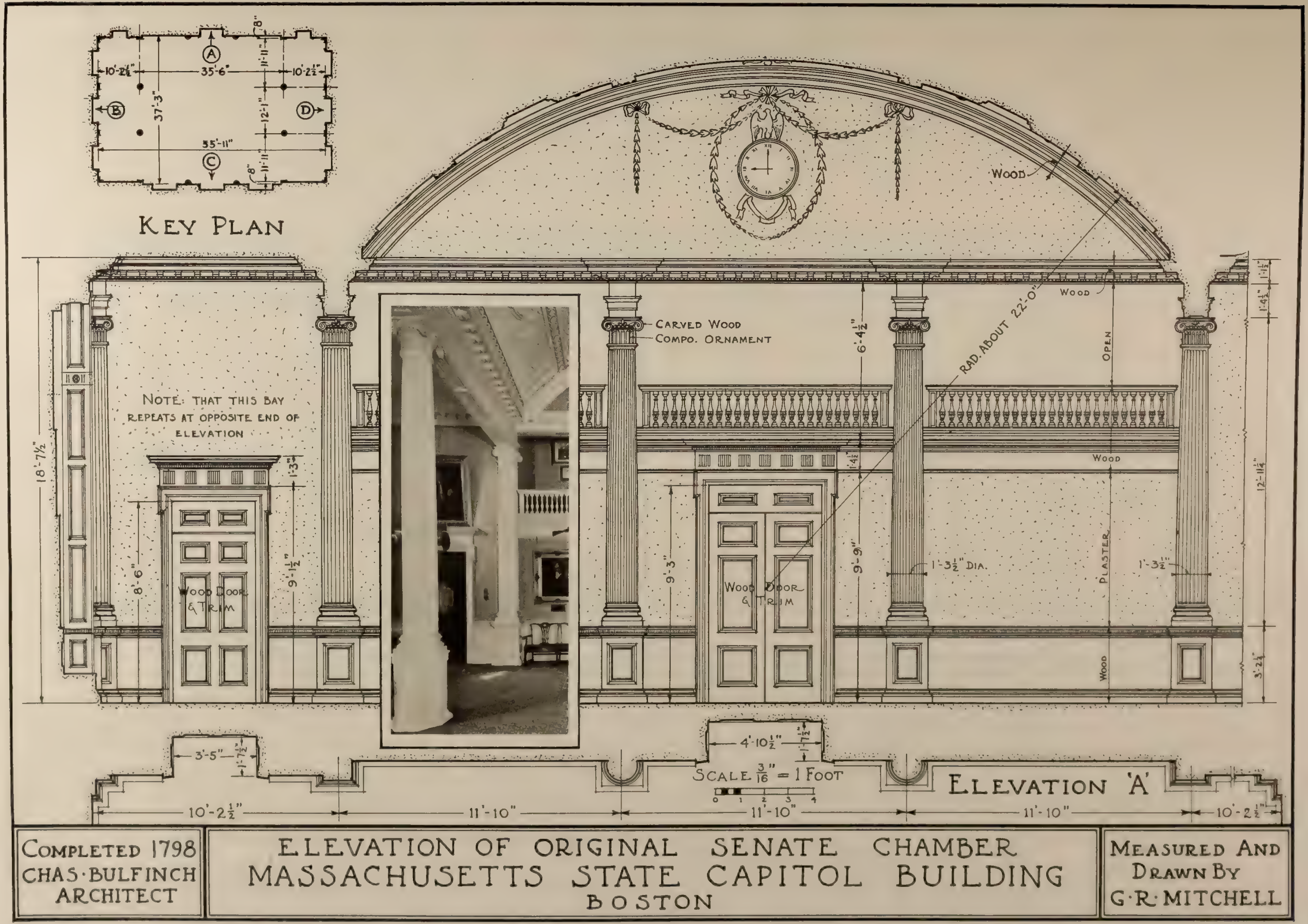
As architect of public buildings from the Capitol of Augusta, Maine, to that of Washington, no American, save Stanford White, has ever surpassed Bulfinch. The Boston State House, with its gilded dome, was built in 1795, when the architect was only thirty-two. This early work was unquestionably his best. Bulfinch brought all his marked originality and skill to the task of adapting the classic style, at that period the basis of English architecture, to the new conditions brought about by the setting up here of a federal government. It is more notable because there was no model anywhere of the kind of legislative hall he wished to build.

Where will you find the twin to the delightful arcaded porch rising to the second story, with the graceful arches below and the stately colonnade with the double columns at the ends, completed by a balustrade?

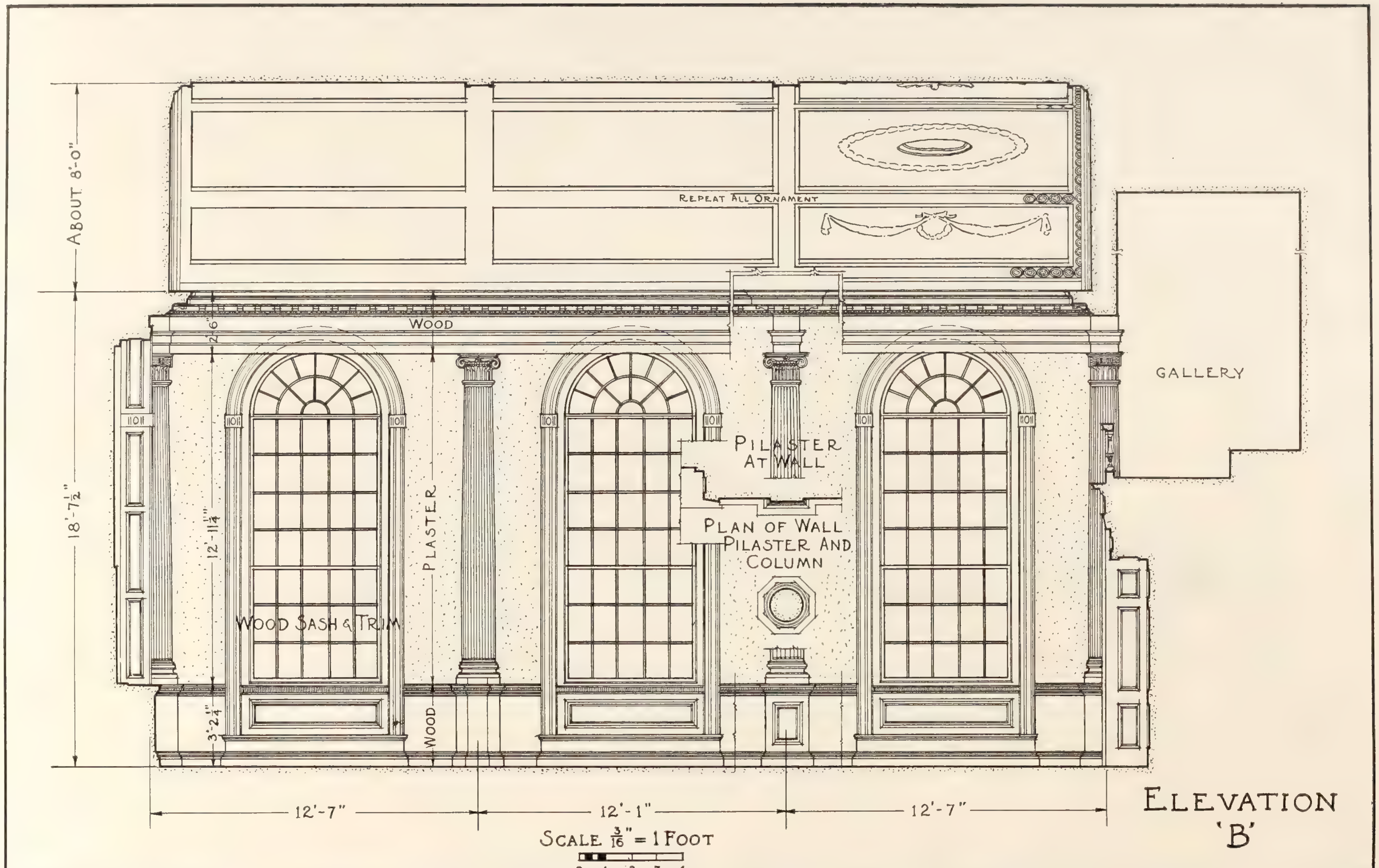
It was a comparatively small building, having a frontage of only 172 feet, and a depth of 65, and, including the dome, a height of 155 feet.

There is no richness of material, brick, and wood serving all the purposes of construction and decoration. Its disposition of parts, however, is so happy, its treatment is so broad and simple, its sparing ornament is so correct in itself and so judiciously used, that it produces an effect of largeness of scale, combined in an unusual degree with grace and dignity—a sort of Adam architecture of noblest type. Though cumbered through the years by "additions and extensions," the finest feature of the State House, the famous Bulfinch front, has been preserved.

President Monroe visited Boston in 1817, and was entertained in the Doric hall of the State House. Greatly impressed with the work of Bulfinch, the following year he invited him to Washington, and appointed him architect-in-chief to rebuild the two wings of the Capitol which had been burned by the British in 1814. Bulfinch spent twelve years on the work, and the Capitol remained as he left it till 1851.



For design and proportion, decoration and detail, the executive chambers on the third floor represent the choicest of their kind in this country.

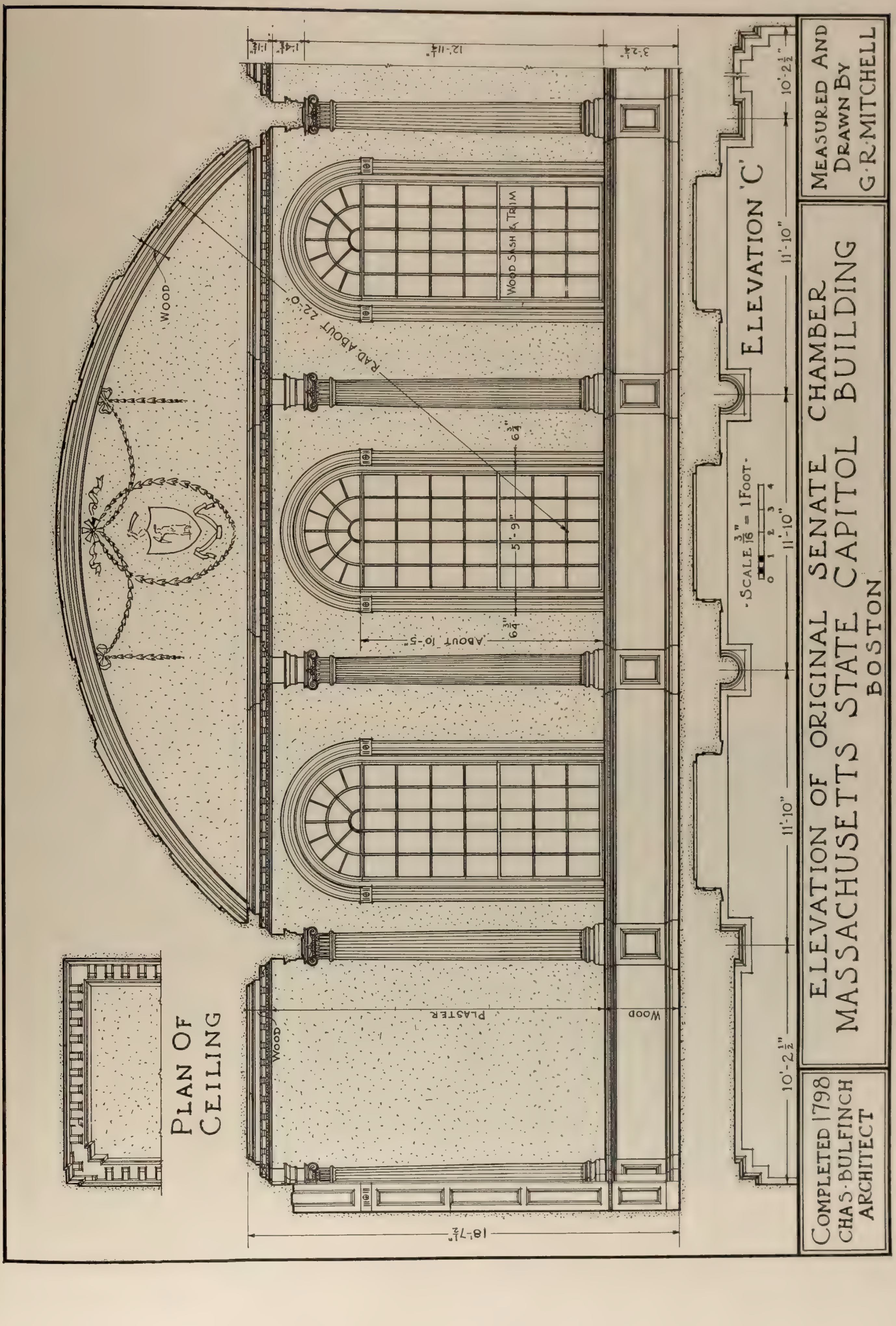


COMPLETED 1798
CHAS · BULFINCH
ARCHITECT

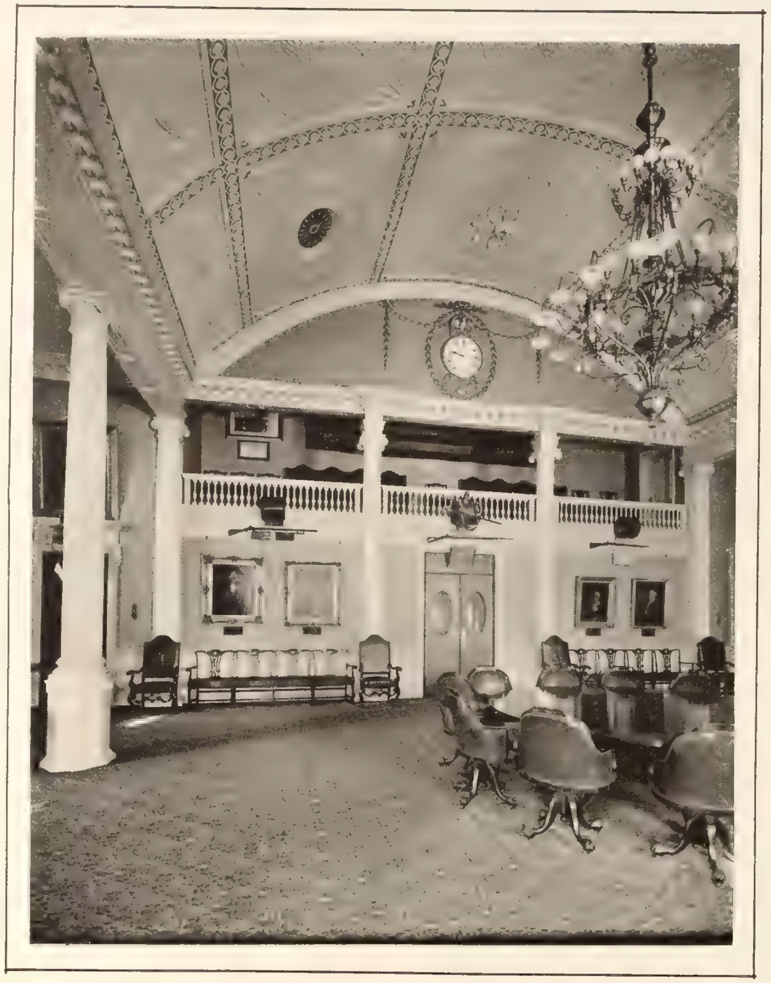
ELEVATION OF ORIGINAL SENATE CHAMBER
MASSACHUSETTS STATE CAPITOL BUILDING
BOSTON

MEASURED AND
DRAWN BY
G·R·MITCHELL

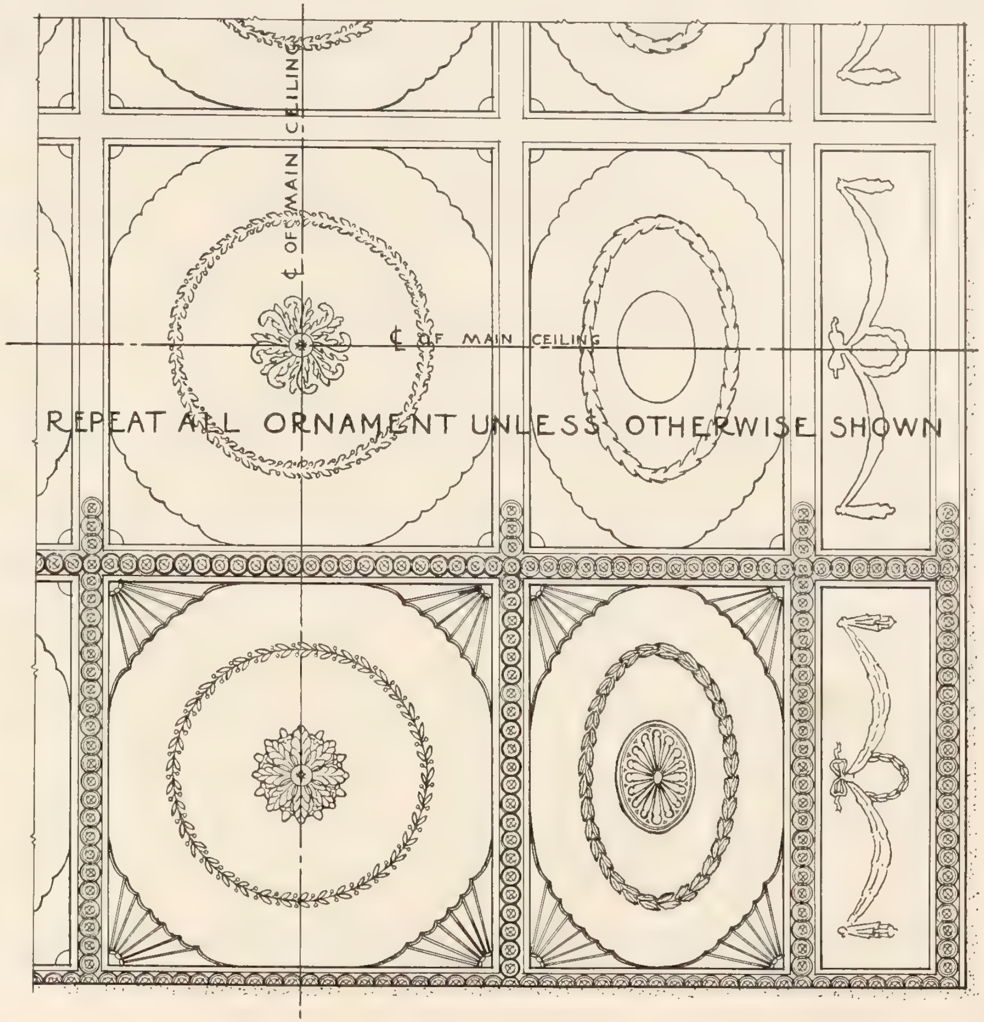
The old Hall of Representatives, now used as the Senate Chamber, occupies the entire central portion of the Bulfinch building, its lower windows opening upon the main balcony behind the Corinthian columns. It is a really magnificent room, 55 feet square, richly finished in wood and painted white. The domed ceiling, with its exquisite decorations of white against a note of cobalt blue, suggests the rarest work of Wedgwood.



The same decorative scheme is carried out in the old Senate Chamber, which serves as the Senate reception-room, in which Bulfinch completed his plan of a Doric interior. These two beautiful rooms bear witness to the supremacy of Bulfinch in the use of delicate and refined details of decoration.



PHOTOGRAPH SHOWING BALCONY
END OF ROOM



SCALE $\frac{3}{16}$" = 1 FOOT

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ARCHITECT

PLAN OF MAIN CEILING OF ORIGINAL SENATE CHAMBER
MASSACHUSETTS STATE CAPITOL BUILDING
BOSTON

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Bulfinch's perfect taste was combined with a classic vigor and boldness of execution, which alone would justify his reputation as the greatest architect of his time, and in many respects of any period of our architectural history.

The Evils of Substitution of Materials in Building

"All works of quality must bear a price in proportion to the skill, time, expense, and risk attending their invention and manufacture."

By W. R. McCornack, A. I. A., Cleveland

THIS is an age of substitution in the building industry. There are two kinds of substitution: first, the substitution of one kind of material for another; and, second, the substitution of one grade for another grade of the same material.

The architects and engineers are, as owners' agents, interested in proper building materials. It is ultimately the building public which should have the whole-hearted co-operation of the material-men, the contractors, the architects, and the engineers, and it is little wonder that the building public is becoming disgusted with buildings which begin to show evidence of pernicious decay within a decade.

When one realizes that the architect and engineer are supposed to know the intricacies of the building industry, varying in type from the cottage of the workman to the great cosmopolitan hives of industry, like our great office-buildings, hotels, railway-stations, institutional buildings, etc., it is obvious that the architect and engineer are in sore need of all the co-operation they can secure from the manufacturer of building materials.

All of you are familiar with slogans for using this material or that, because it is better, because it lasts longer, or because it is cheaper, and your organization has been the victim of much propaganda which has not been based on scientific facts.

There is a story told of the small, country general-store keeper, in a Western State, who sold some shingles to a farmer with which to roof his barn. This honest storekeeper also sold the nails with which to put the shingles on. A few days later the farmer came back and said: "The carpenter says he wants different nails, these are hard to drive." The storekeeper replied: "The nails I sold you are the right nails for this job. If you won't use these nails, bring back the shingles."

Architects and owners are prone in this day of substitution to do what they call reducing costs by substitution. After they have reduced the cost per cubic foot ten or fifteen per cent by this method, they go serenely on their way, unconscious perhaps of the fact that while they have reduced the cost per cubic foot, yet they took no account of the number of cubic feet within the building and no thought of reducing that. I know of one building, which was recently reduced three hundred thousand cubic feet without reducing its usable area, which was a twenty-five per cent reduction in the cost of the building, and enabled the owner to construct his building with better building materials than he had hoped to get. Therefore the people who are supplying material for construction should organize to know their material, to be able to present scientific data upon which to base specifications, and to furnish a reasonable method of protection to the buyer, so that what is specified will be furnished.

I know of many cases where window-frames have rotted out in an unbelievably short time. Is it any wonder then that the owner believes that the solution of his trouble lies in using steel instead of the kind of wood suitable for frames? Is it any wonder that the Western lumber-dealers in shingles received a serious setback in business because of the fact that the wrong kind of shingles were furnished the public, which resulted in a huge sale of substitute material?

During the year I have seen many cases from Egypt fifty centuries old, made of cedar and in good condition. I have seen a complicated wooden ceiling which was taken from a room of a Spanish castle in which Ferdinand and Isabella received Columbus. Nearly five centuries have passed since this room was built and yet every stick of wood in this ceiling was in perfect condition, even the woodwork which was behind the face of the ceiling and, therefore, concealed from view. I have seen another room taken from an English home built in 1695. All the woodwork, including the studding, the lathe, and cross-bracing, was in perfect condition.

With these startling examples of the longevity of the material in which you deal, I marvel that so much inferior woodwork is permitted to come into use.

I believe, and this is not an idea originating with me, that every deed for every house that is constructed should carry with it a form of insurance policy which bears the signature and affidavit of the architect, contractor, and building-supply man that the building contains honest material, and that it is honestly built in accordance with proper drawings and specifications.

There is no economy in the substitution of poor material. I know of school-buildings upon which the upkeep is so great as to be almost unbelievable, due entirely to the use of poor material and poor construction. Substitution—the substitution of bad for good.

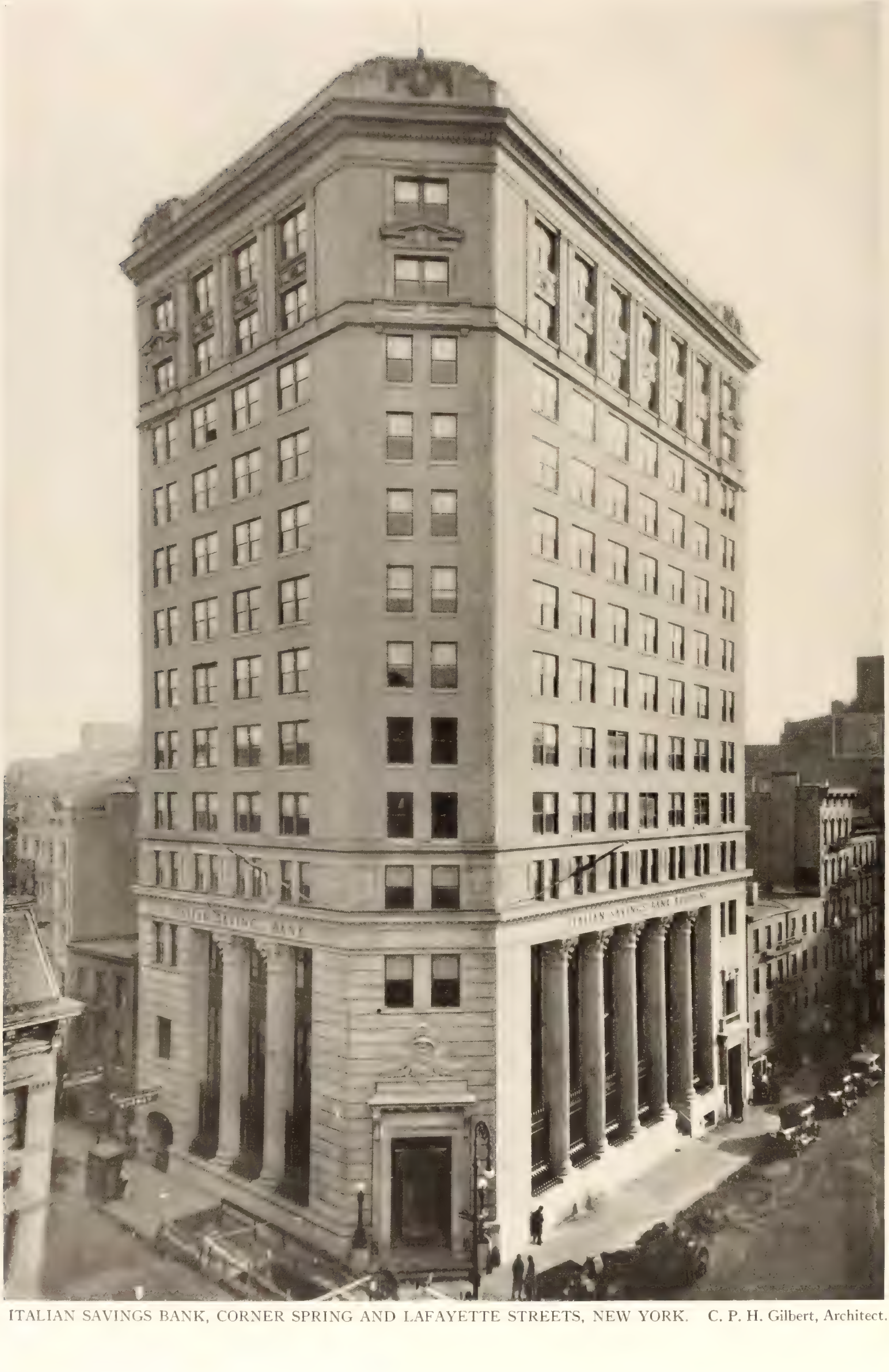
The architect welcomes the proper grading of lumber and the proper stamping of it, because he will not only be protected and helped in his own work, but more because the building public will receive for its dollar a dollar's worth.

The following quotation from Ruskin tells the story of the penalty which will inevitably follow the use of inferior material and workmanship in the building industry:

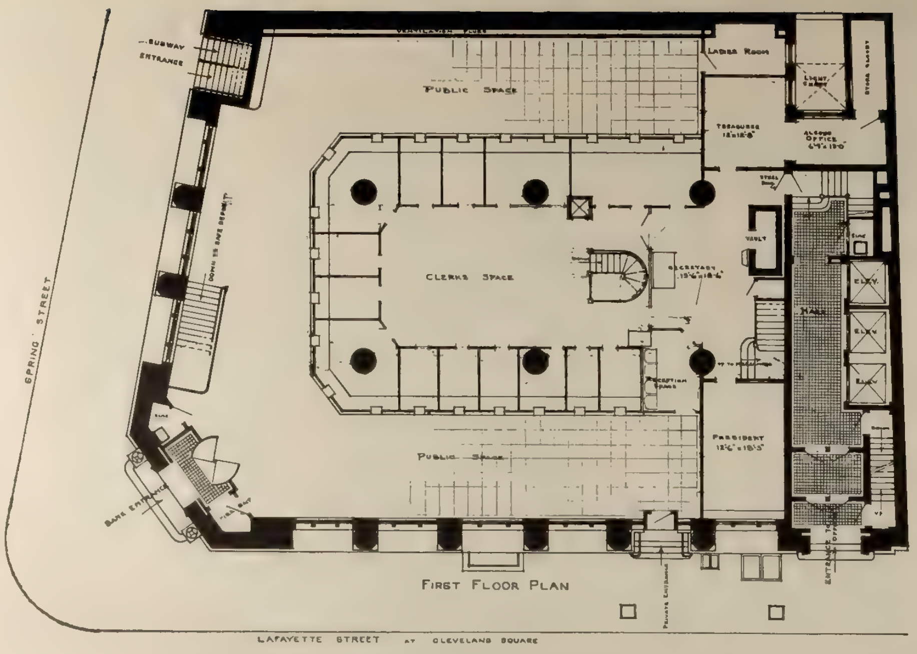
"All works of quality must bear a price in proportion to the skill, time, expense, and risk attending their invention and manufacture. Those things called dear are, when justly estimated, the cheapest. A composition for cheapness and not for excellence of workmanship is the most frequent and certain cause of the rapid decay and entire destruction of arts and manufactures."

Competition for House Beautiful Cover Designs

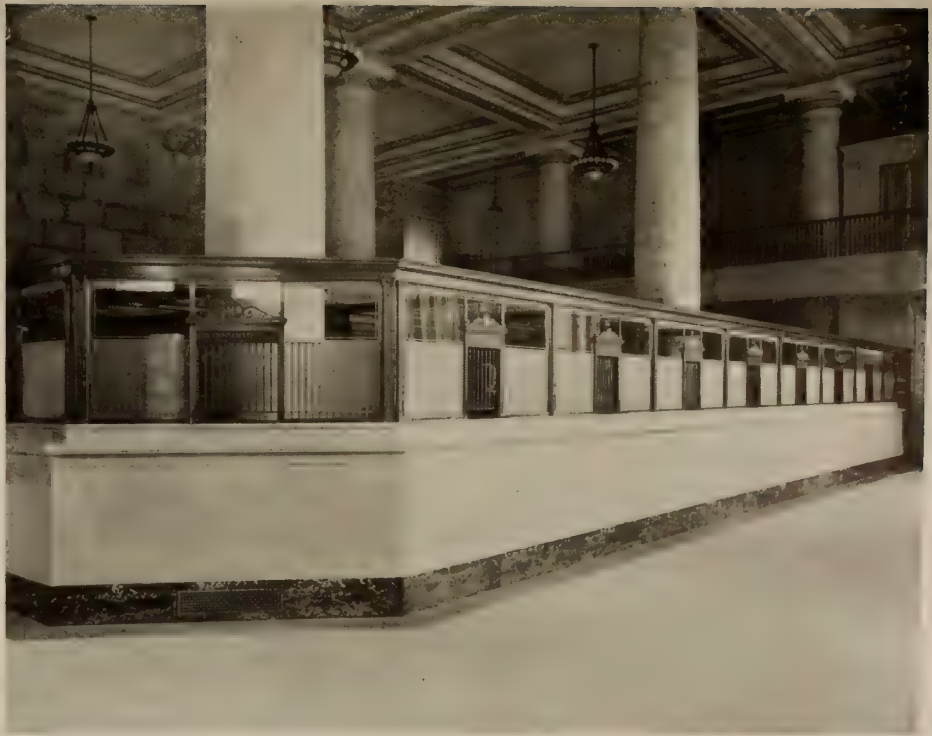
THE House Beautiful Cover Competition has been an annual event now for the past three years. The announcement of the Fourth Competition contains an addition to the usual quota of prizes. The First Prize is $500; the Second Prize, $250. In addition to these, this year, and in addition also to the possible purchase price of a design, is offered a Special Prize of $100, with a Certificate of Merit, for the best design submitted by a student of any School of Art. The competition closes January 29, 1926. Full particulars regarding it may be obtained from the Competition Committee, House Beautiful, 8 Arlington Street, Boston, Mass.



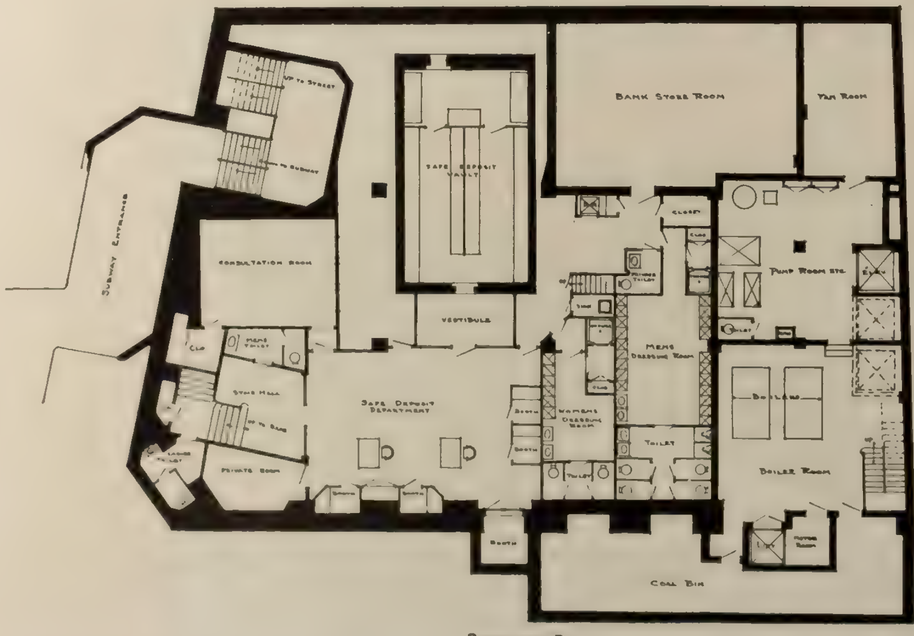
ITALIAN SAVINGS BANK, CORNER SPRING AND LAFAYETTE STREETS, NEW YORK. C. P. H. Gilbert, Architect.



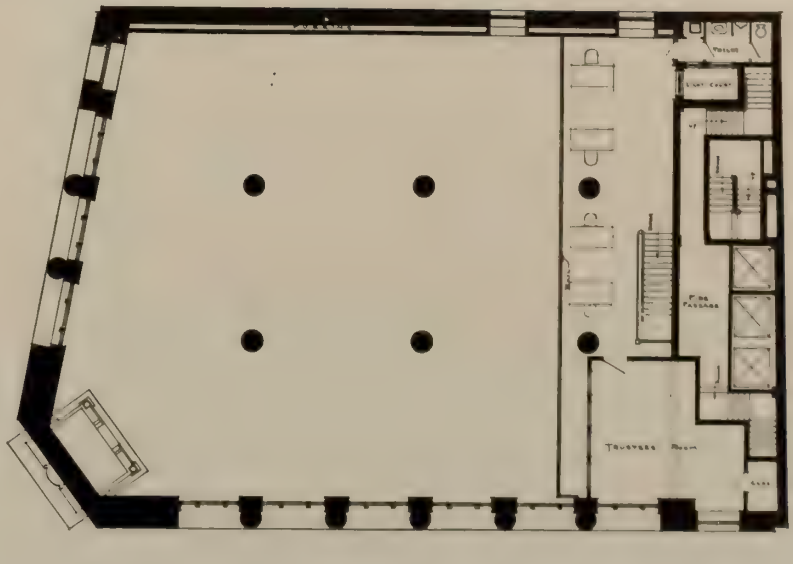
FIRST FLOOR PLAN



BANKING-ROOM.



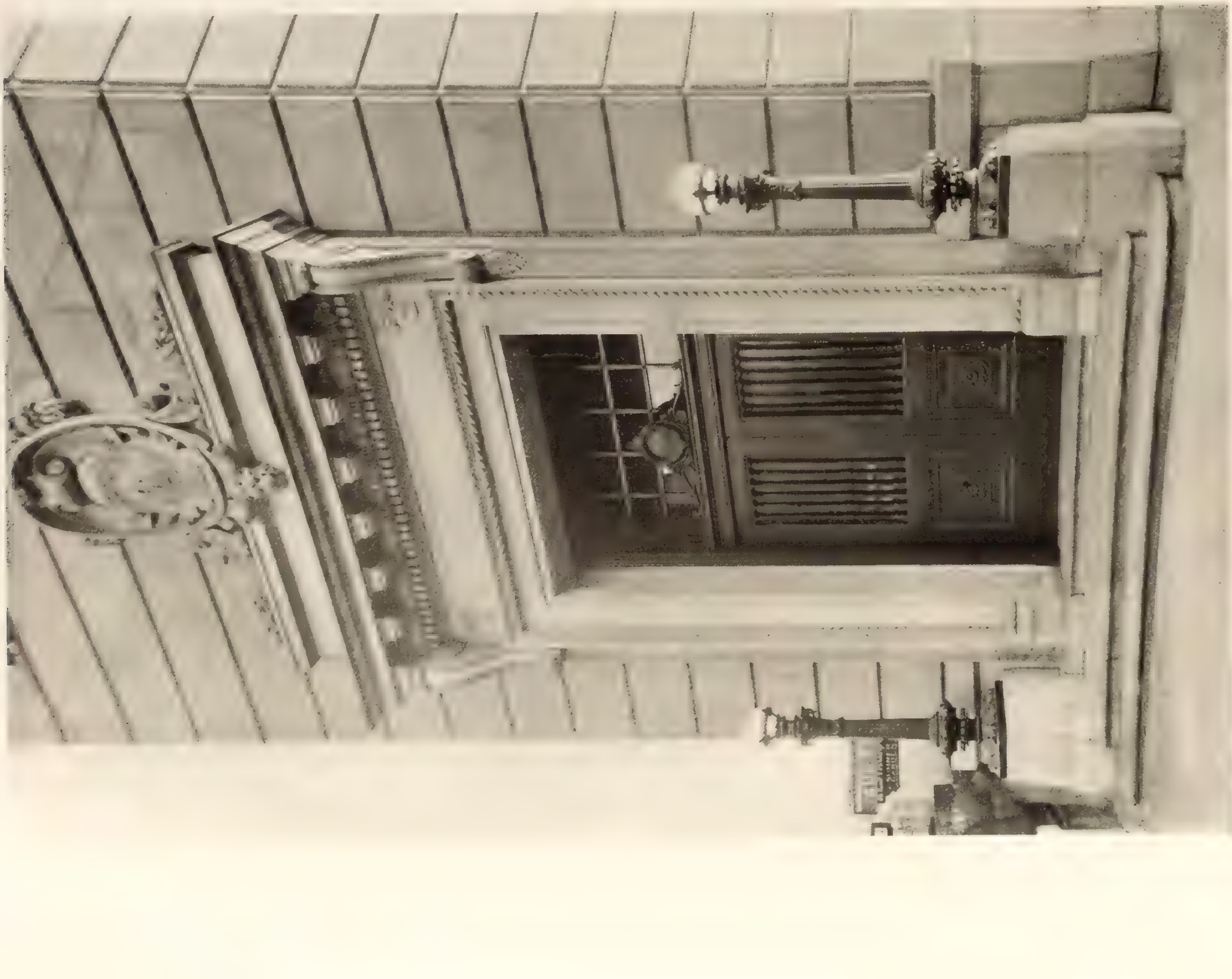
BASEMENT PLAN



MEZZANINE PLAN

ITALIAN SAVINGS BANK, COR. SPRING AND LAFAYETTE STS., NEW YORK.

C. P. H. Gilbert, Architect.



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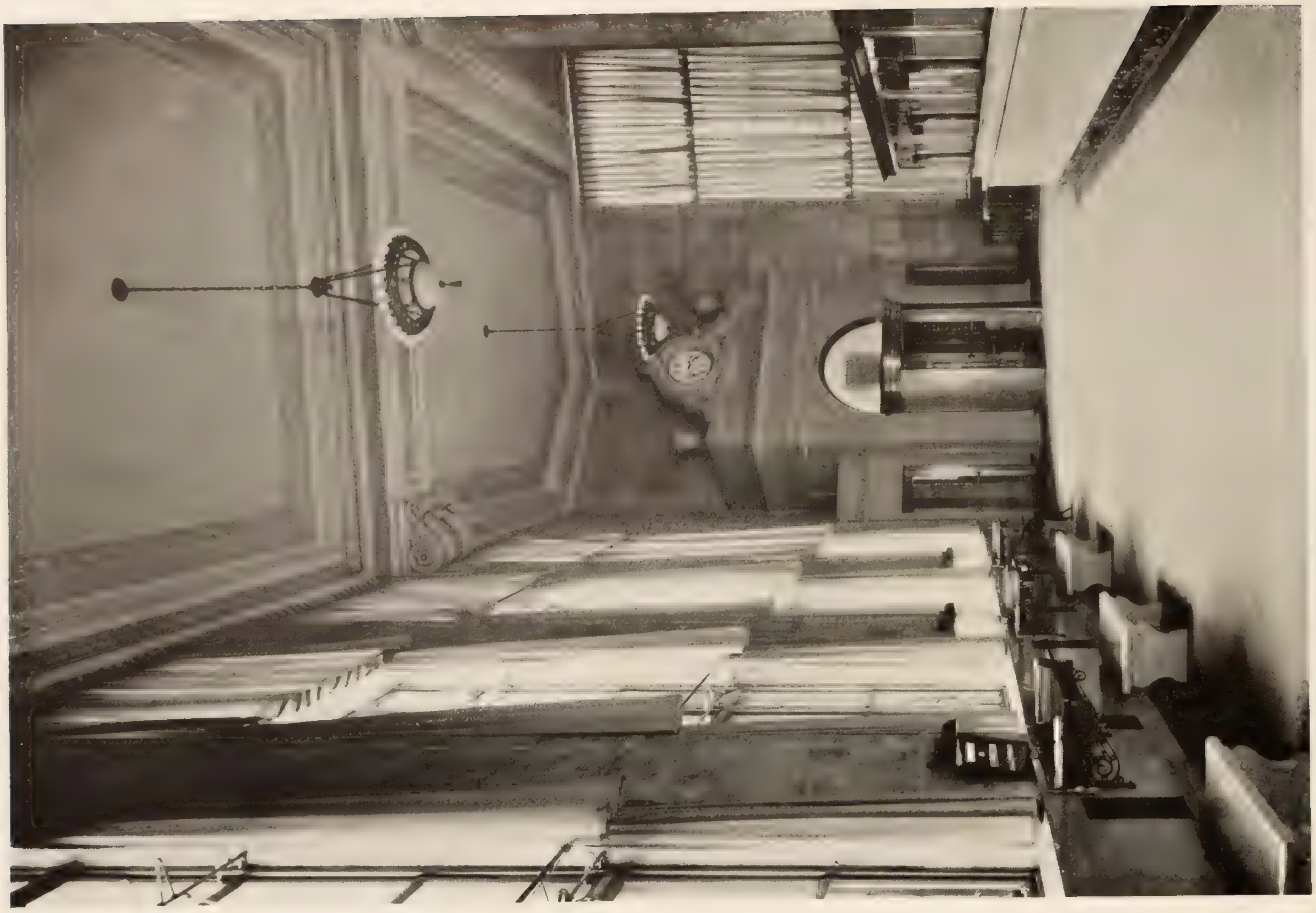

BANKING-ROOM TOWARD ENTRANCE.

C. P. H. Gilbert, Architect.

ITALIAN SAVINGS BANK, COR. SPRING AND LAFAYETTE STS., NEW YORK.

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Editorial and Other Comment

On Being Educated

OF the many problems following the war, one thing that is being insistently discussed is the changed attitude toward the matter of education. There is a surprising amount of frank criticism being written about the work of the colleges, and some of the most illuminating is that from the learned professors themselves. The old methods seem to be under fire, and the net result of four years of more or less intensive study of the regular old-fashioned courses appears to be lacking in those things that prepare men for taking up the real burden of life. There is a lot of nonsense talked about cultural things, and just what is meant by "cultural" apparently needs defining. Is it superrefinement, a sensitive and sympathetic response to the little niceties of conduct, a love of beauty, a generous attitude toward others, a wish to please and be of service rather than to grab everything in sight? If so, such a conception of culture seems out of date in more ways than one. If it leads anywhere it is apt to lead to what we speak of as an "inferiority complex," and there is no place in this modern world for such doctrine.

Being nice may have its advocates in old-fashioned circles, but the public at large has little use for the modest person, or for the mere theorist regarding human conduct or the ways of men in general. Our universities are beginning to wake up to the fact that education is not to be found in books, but in learning to use what faculties we may possess to some end beyond dreaming of high and mighty deeds. An architect of wide experience in teaching in one of our great architectural schools said recently that the average boy graduated with a head full of ideas about beauty and the history of architecture, and with little real practical preparation for the profession he intended to follow. It required several years of drudgery in offices to make him realize that about half of his education was worth the proverbial thirty cents. Young men just out of college looking for jobs often wonder why it is that an equipment of several modern languages, a superficial acquaintance with the classics, maybe, the ability to indite a passable sonnet to some lady's eyebrow, and the best of social connections do not open the way at once to the chance for showing what they can do. The trouble is that when asked what they want to do or what they think they want to do, they are dumb and look off into space, hunting the definite idea they should have brought with them.

The education of the architect is receiving its due degree of consideration and, maybe, like the colleges in general, the result will be to get down to brass tacks and do away with a lot of encumbrances in the way of higher mathematics, substituting therefor more information about the practical business things that are required nowadays, even in such an idealistic profession as architecture. Teaching should involve a course of sprouts in handling men on the job and in office management.

We have been laboring for years under the impression that education might be found in books, but in these latter days we have learned that life itself is the big book that we should read intensively if we want to be in the parade and not be just a standee on the side-lines.

Takes a big crack to wake some of us and, happily, unless we have been asleep at the switch, we can take the crack and get up smiling at ourselves for being such dummies all the years.

We have books on the psychology of business, books on the psychology of salesmanship—that's the stuff—salesmanship. One of the best sellers of recent years is one of these books that tells you how to size up the other fellow, how to get him to buy whether he wants to or not.

The architect needs to read a lot of this kind of stuff—some should, at least—for these are days when a nice office and a few real antiques, perhaps several framed prints of famous classic temples, have lost much of their pull.

Sadly but truly many men of the old ways have been rudely made aware that "salesmanship" is the real art asset that brings home the bacon. Some of us were taught a bit too much of the idealistic stuff and too little of the facts without which our ideals never develop into more than a feeling of self-conscious and snobbish superiority. The education we all need is the one that helps us to think, and that is about the hardest job that any body of teachers tackles.

In his interesting "Short History of the Building Crafts," Martin S. Briggs, F.R.I.B.A., says these pertinent things: "The architect of to-day must be the master-builder as well as a draftsman. There has been a tendency in some schools of architecture to unduly stress the value of good draftsmanship. The architect should be reminded in student days that his primary function is to *create* good buildings, and that it is only by this means that he becomes an architect."

There is no divorce between architectural design and building construction—as is too often imagined in the schools—and no "eternal triangle" of design, tradition, and construction.

A Chance to Study Setback Architecture in Bulk

NEW YORK architects have been compelled by circumstances to study the setback problem, and they have gone about solving it with some considerable skill here and there; but when all is said and done it is going to take time to make us think that it is a way to beauty. During the past months whole rows of setbacks have gone up on Forty-seventh and Forty-eighth Streets, New York, and to even the man in the street without any least knowledge of architecture they must seem more or less monstrosities. They have the earmarks of hurried construction and hurried design, and in many cases the materials of which they are built show that the "commercial" spirit dominated their inception, and that the poor architects had but to do or die.

The redeeming thing about most of them as we have watched their development has been the marvel of their great steel cages that have towered up in the sky, with a few little figures of men crawling about the beams, putting them together. In this age of steel, the miracle of the modern high building never loses its interest. The absolute accuracy with which these structures are fabricated and brought piecemeal to the site, to be assembled by the fearless chaps who scramble over narrow beams hundreds of feet above ground, the staccato machine-gun rattle of the riveters, the silhouettes of a tangle of beams going aloft with a group of attendant pygmies, the starting of walls half-way up the structure, the system and rapidity with which a great building rises and becomes a commonplace of the street, in spite of much ugliness, continue to have an enduring appeal.

Building is one of the greatest of our industries, and in spite of high labor costs and high cost of materials, there is a fairly feverish impetus to the uprearing of an unending procession of places where men may work and realtors and investors profit.

The Progressive South

ACCORDING to recent building reports an unprecedented and continued development goes on all over the country; and be it noted that the South is especially awake to her opportunities. The great amount of business being done there is a happy augury of the future.

Of course Florida is the boom State, and Miami is out to gather in all the shekels that are floating about without a home down North.

Fourteen cities of Florida had building permits in one month amounting to more than $25,000,000.

Just how far this building activity, and the real-estate speculative market, are going no one dare predict, but that they may easily develop into a situation of danger is not without consideration in the thoughts of careful native investors.

Overvaluation and ballyhoo methods have had their day in the land of sunshine and flowers; that means, in this case, California—we specify for fear of getting in wrong with the Florida grape-fruit industry.

We are pleased to remark that a number of Northern architects have established offices in Florida, and that others have been called in to design important work.

Well-known New York men have, for a number of years, been closely associated with important Florida enterprises, and several show-places of the very rich were designed by them.

There will be more palaces, apartment-houses, etc., etc., to be built, and it might not be a bad investment for some of our architects to make it a point to spend a few weeks in Florida investigating prospects. They can get away from the coal strike, the snow and slush of the Northern winter, and maybe come home with a commission and a better golf score. Think it over. No, we are not interested in selling any Florida real estate, much to our sorrow.

"'Tis a Consummation Devoutly to Be Wished"

WE are sincerely sorry that we did not more carefully consider the possible effects and facts of Mr. Martin's animadversions in his recent article criticising the work of the Allied Architects Association of Los Angeles, and ask some of our friends of that association what they thought of his point of view, *before we published*. Needless to say we have heard from several of our friends in terms that indicate that we were lacking in sufficient knowledge of the real conditions. Contrary to Mr. Martin's opinions we are advised by a prominent and well-known member of the local Institute Chapter whose judgment we value highly, that: "I know that the members of the association have most unselfishly given of their time and services for a considerable number of years in order to rescue the public work (and the public work only) of our communities here from the debased political hands into which it had fallen. Practically all of the most respected and professionally responsible architects of Southern California are members of this Allied Architects Association."

Blindness in Industrial Occupations

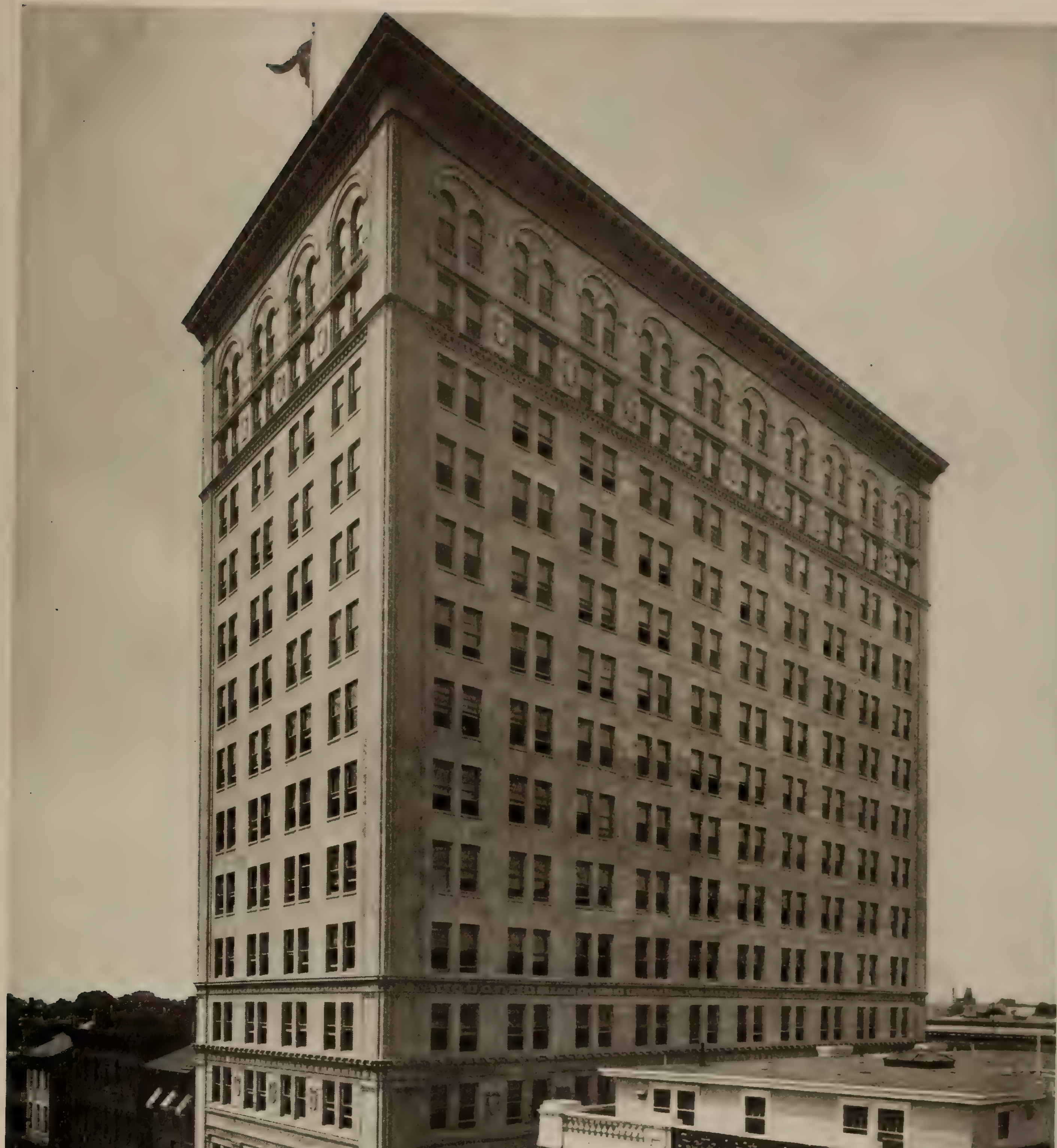
THERE is no such thing as a non-hazardous industry—this is the conclusion of the National Committee for the Prevention of Blindness as indicated in the report of an extensive study of eye hazards in industrial occupations recently completed by the Committee, a summary of which was issued recently by Lewis H. Carris, Managing Director of the Committee.

The report declares that "of the 100,000 blind persons in the United States, approximately 15,000 are the industrial blind—persons who have lost their sight in the pursuit of industrial occupations—and there is in addition to the totally blind a much larger number of men, women, and children whose vision has been so impaired by the eye hazards of industry that they are handicapped throughout life. Both of these classes, the industrial blind and the workers whose vision has been seriously impaired by the hazards of other industrial environment, grow larger each year."

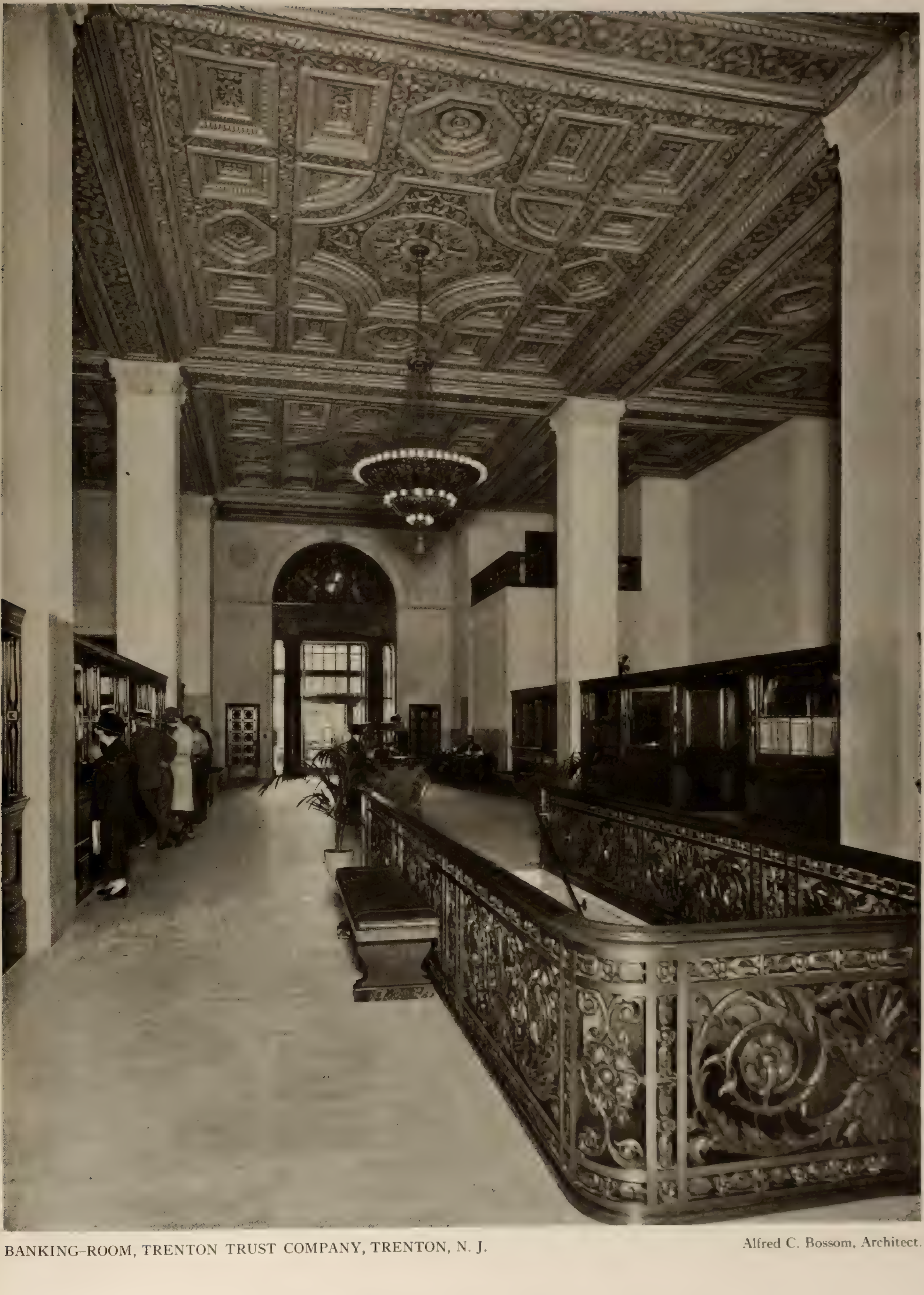
There is hardly an industrial occupation in America, according to the National Committee, which does not add each year to the steadily increasing number of the blind and the near-blind. Referring to the experience of just one insurance company which in three and a half years settled claims involving 1,049 cases of permanent disability resulting from eye injuries, the report says: "The loss of eighty-two eyes in the presumably safe occupations of merchandising, farming, and textile manufacture, is further proof of the statement that serious eye accidents are likely to occur wherever men, women, and children are employed. There is no such thing as a really non-hazardous occupation."

The Committee found that although from a national point of view the metal manufacturing industries are the source of the greatest number of serious eye injuries, in Pennsylvania the coal-mining industry ranks first as a cause of industrial blindness. In Wisconsin it was found that hand tools constitute by far the greatest single cause of eye injuries, being responsible for 44 per cent. As an example of the important part that eye injuries play in the whole problem of industrial accidents, the report cites the experience of a large shipbuilding company in whose dispensary 38 per cent of all injuries treated were eye injuries. More than 4,300 eye cases were treated in the dispensary of this one company in one year.

The section of the report dealing with the nature and cause of eye injuries closes with the statement: "Until industry knows exactly where, when, how, and why eye accidents occur, it will not be in a position to do justice to the existing opportunities for the elimination of such accidents, much less to develop new means of prevention. The keeping of detailed and accurate records of the nature, causes, and costs of eye injuries on the standard basis developed by the International Association of Industrial Accident Boards and Commissions is, therefore, recommended as the first step in any campaign for the prevention of eye accidents in the individual industrial plant, or in an entire industry."



TRENTON TRUST COMPANY, TRENTON, N. J. Alfred C. Bossom, Architect.



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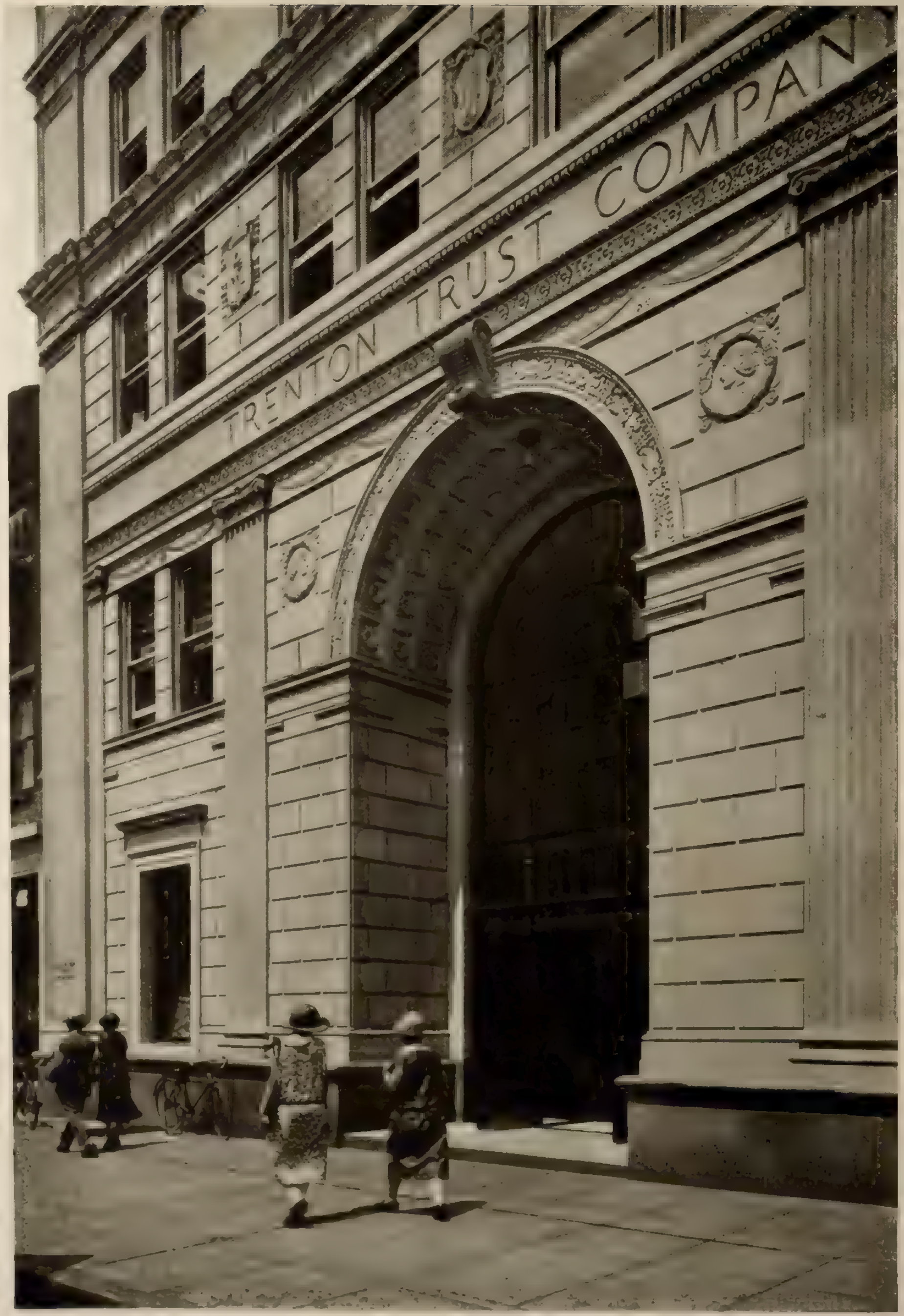

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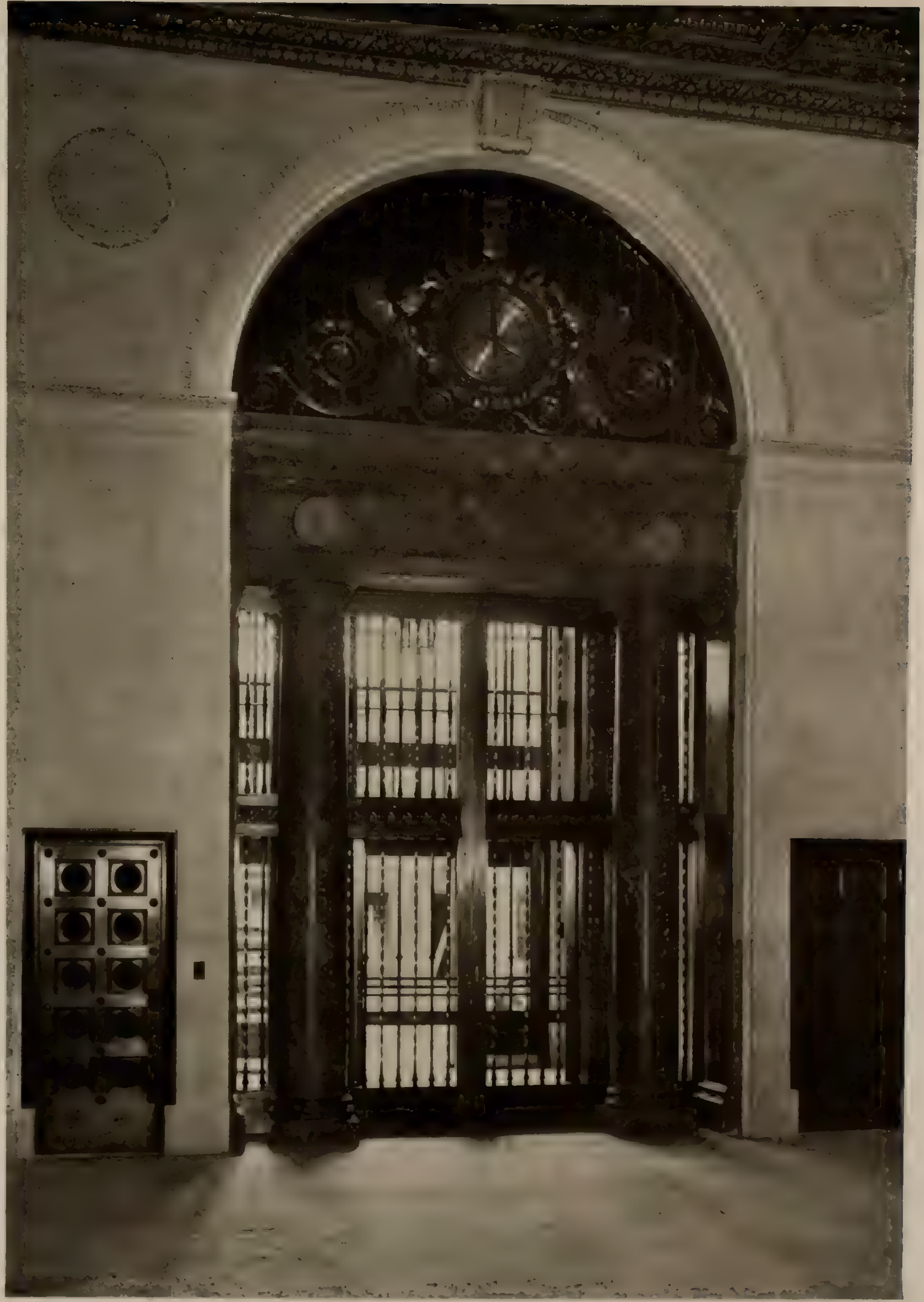

DOORWAY TO LOBBY.

Alfred C. Bossom, Architect.

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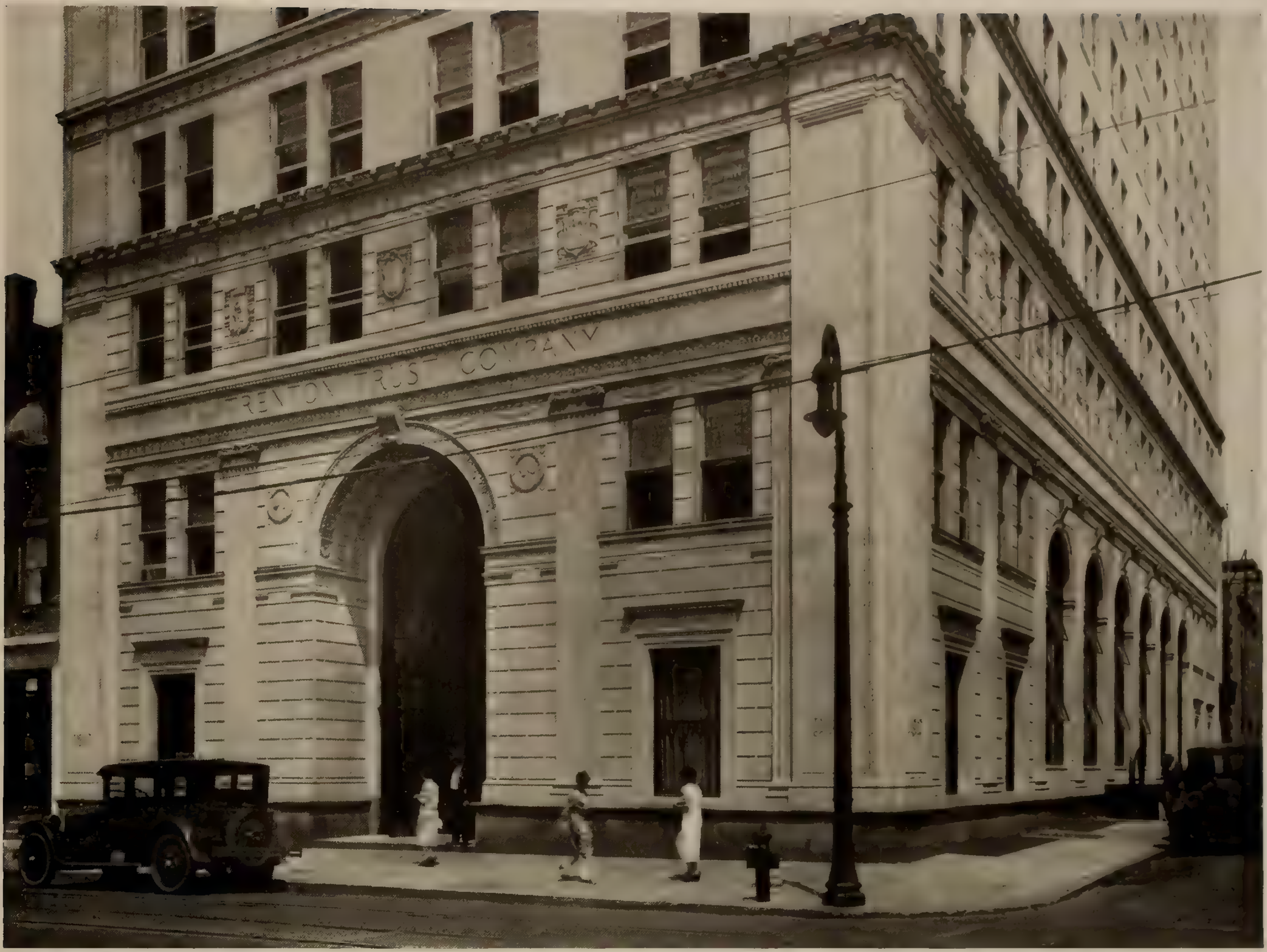
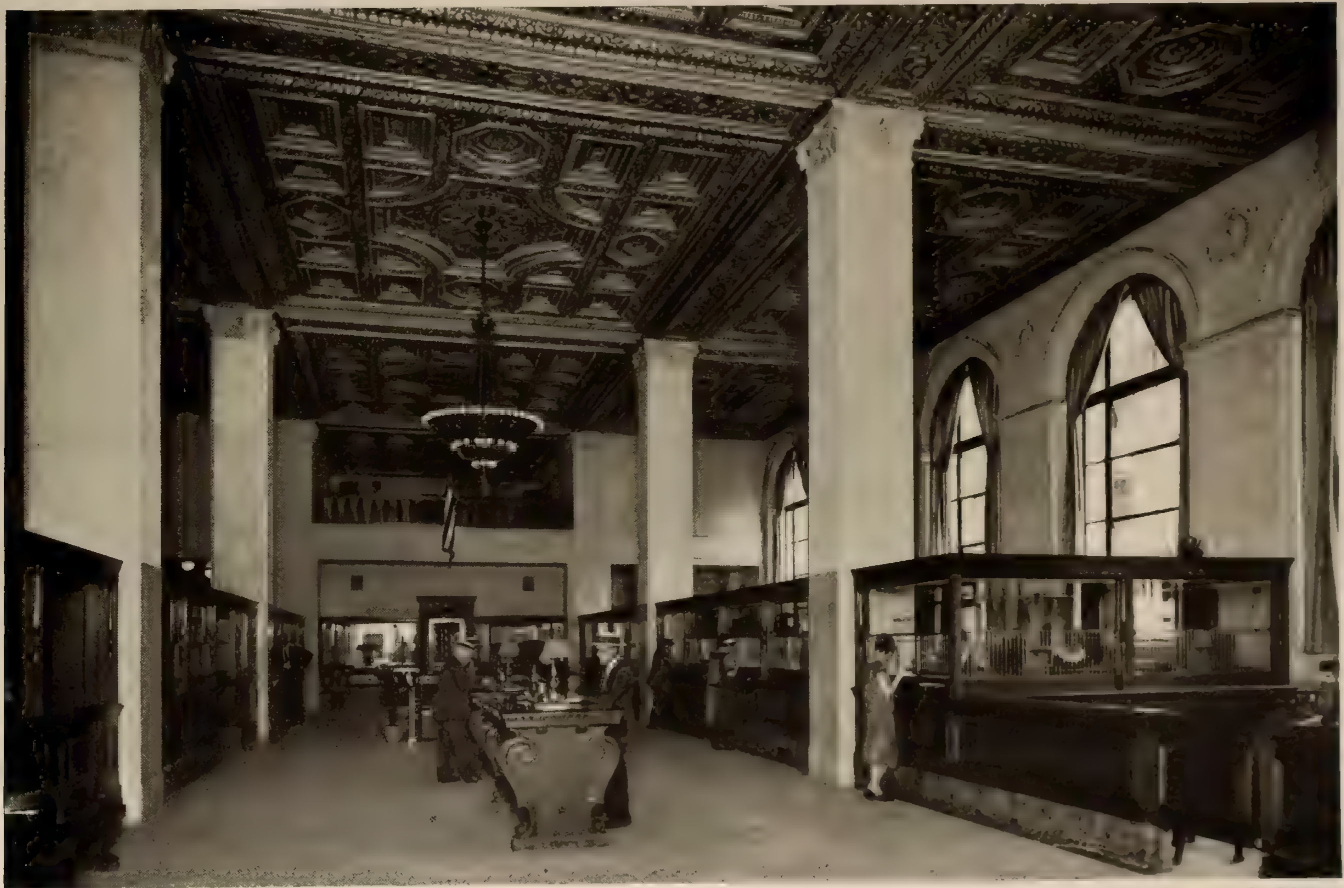


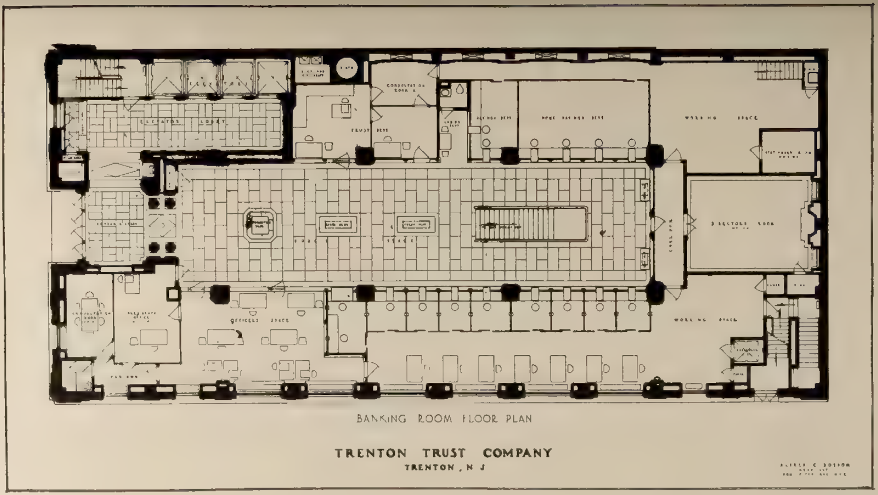
DETAIL, LOWER STORIES.

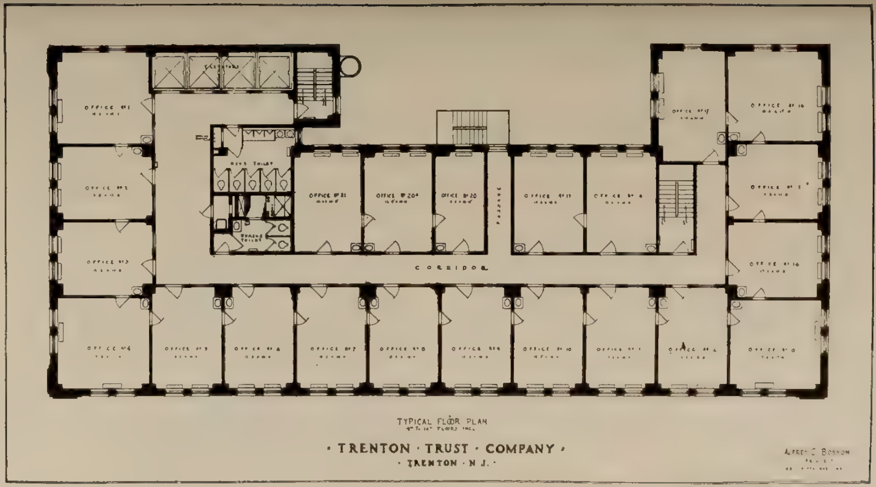


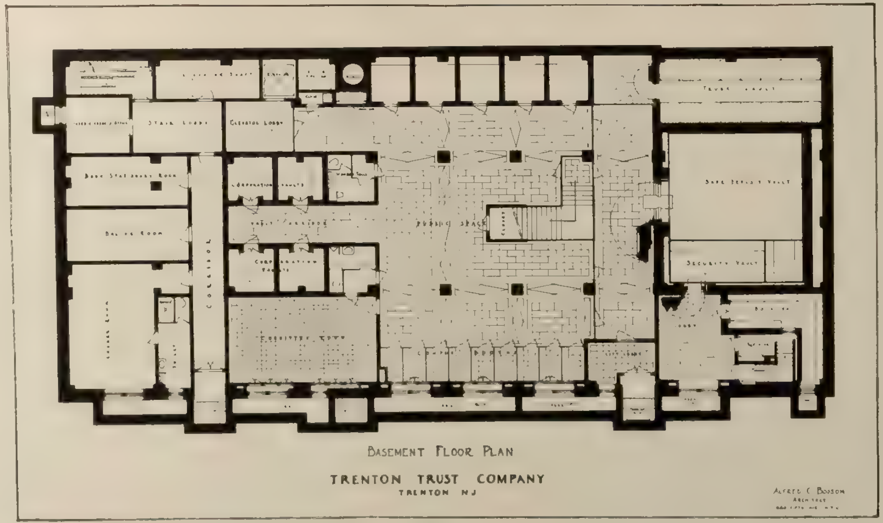
BANKING-ROOM, TOWARD DIRECTORS' ROOM.

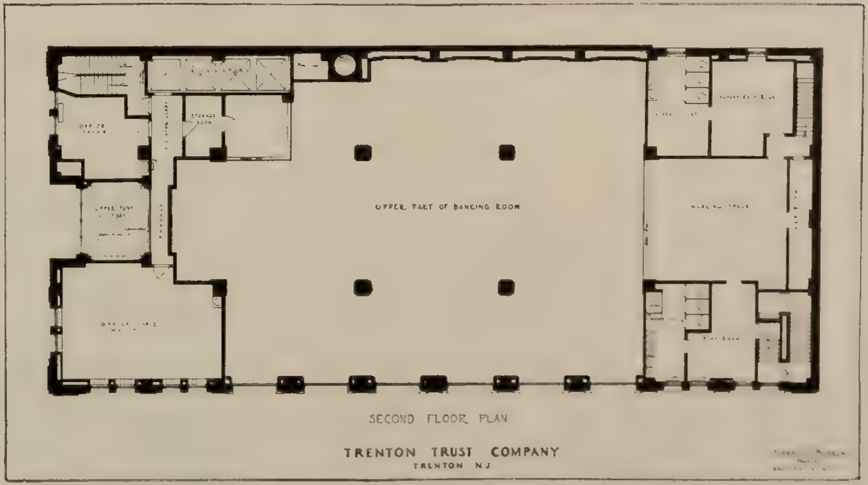
Alfred C. Bossom, Architect.

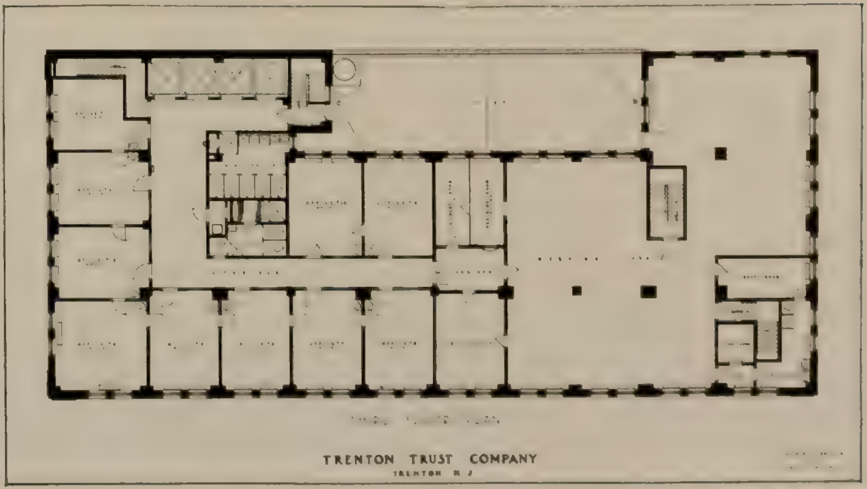
TRENTON TRUST COMPANY, TRENTON, N. J.



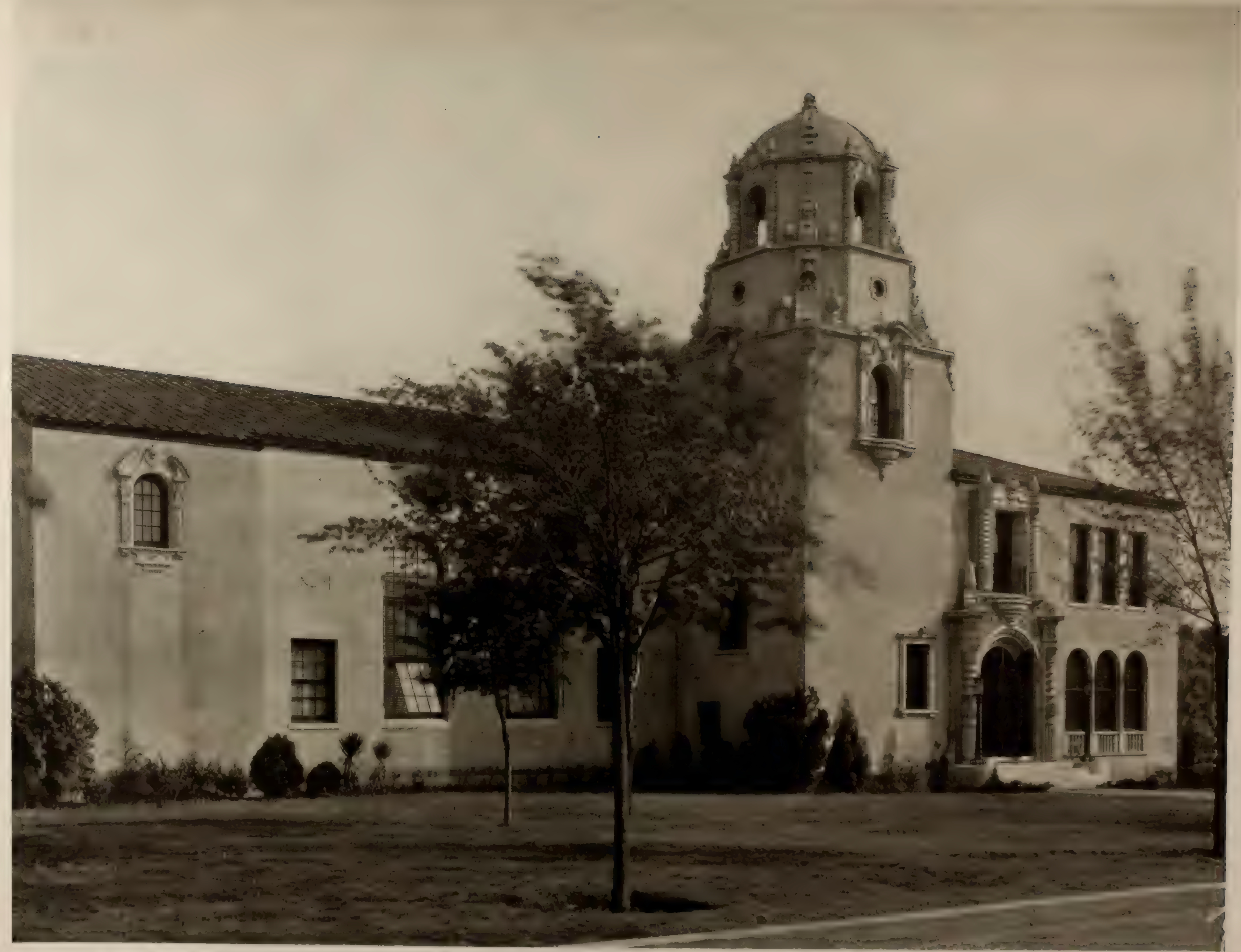






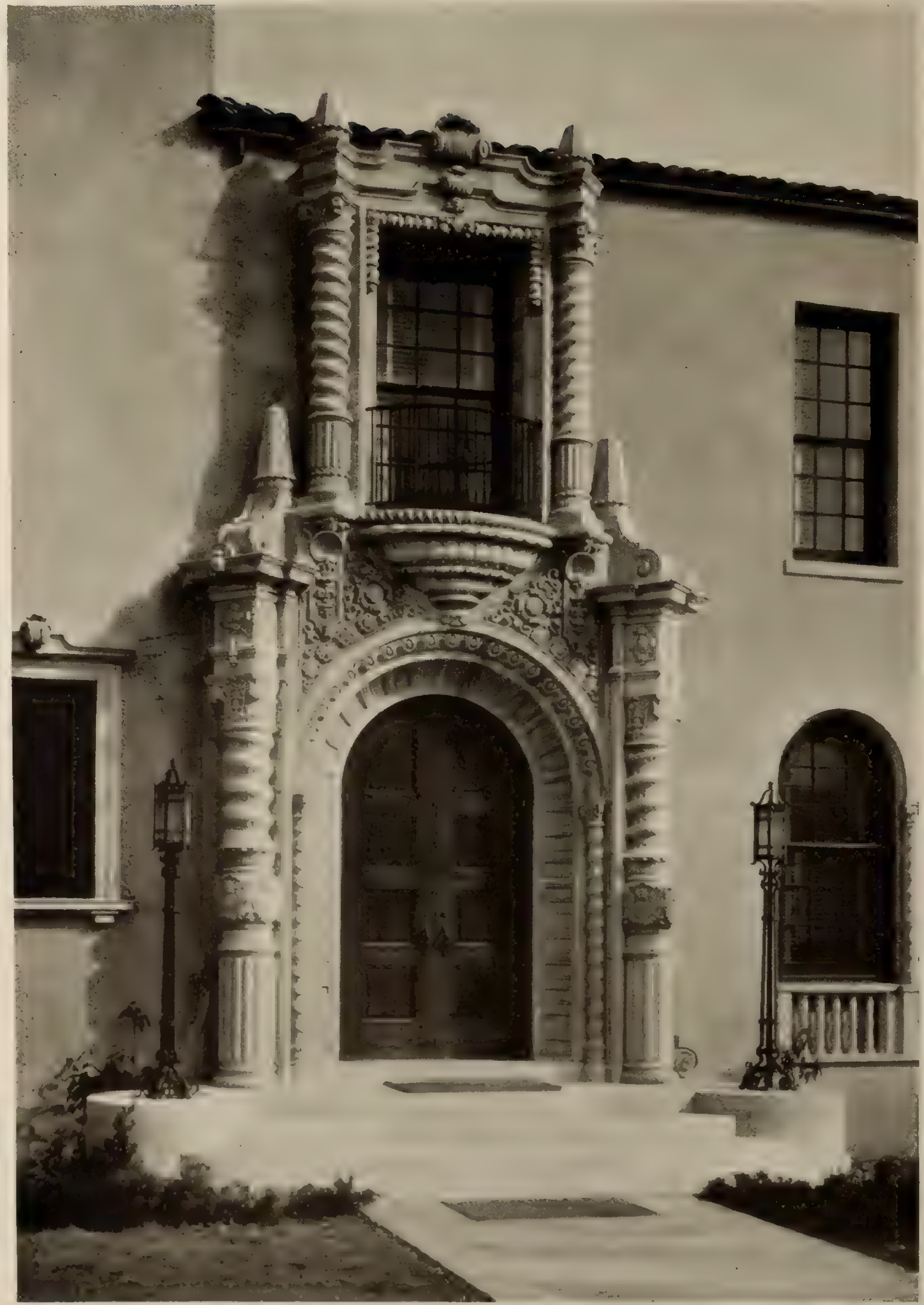


THE TRENTON TRUST COMPANY, TRENTON, N. J.
Alfred C. Bossom, Architect.



HIGHLAND PARK CITY HALL, DALLAS, TEXAS.

Lang & Witchell, Architects.



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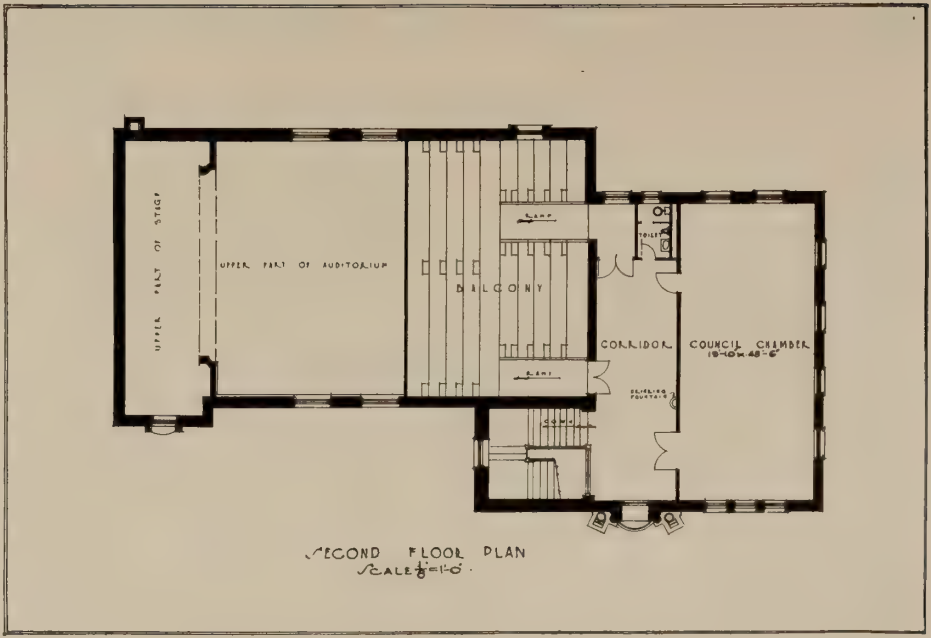

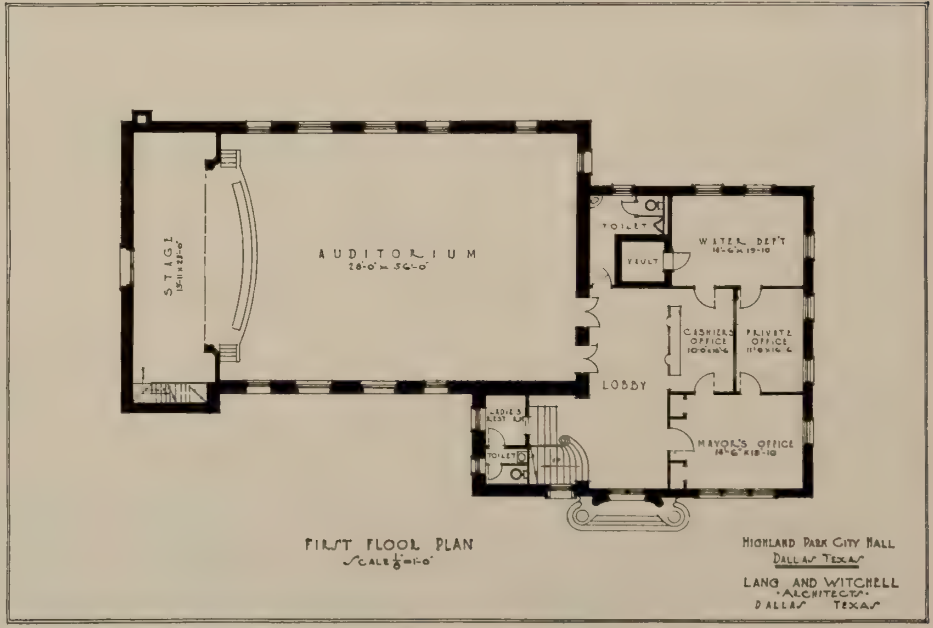

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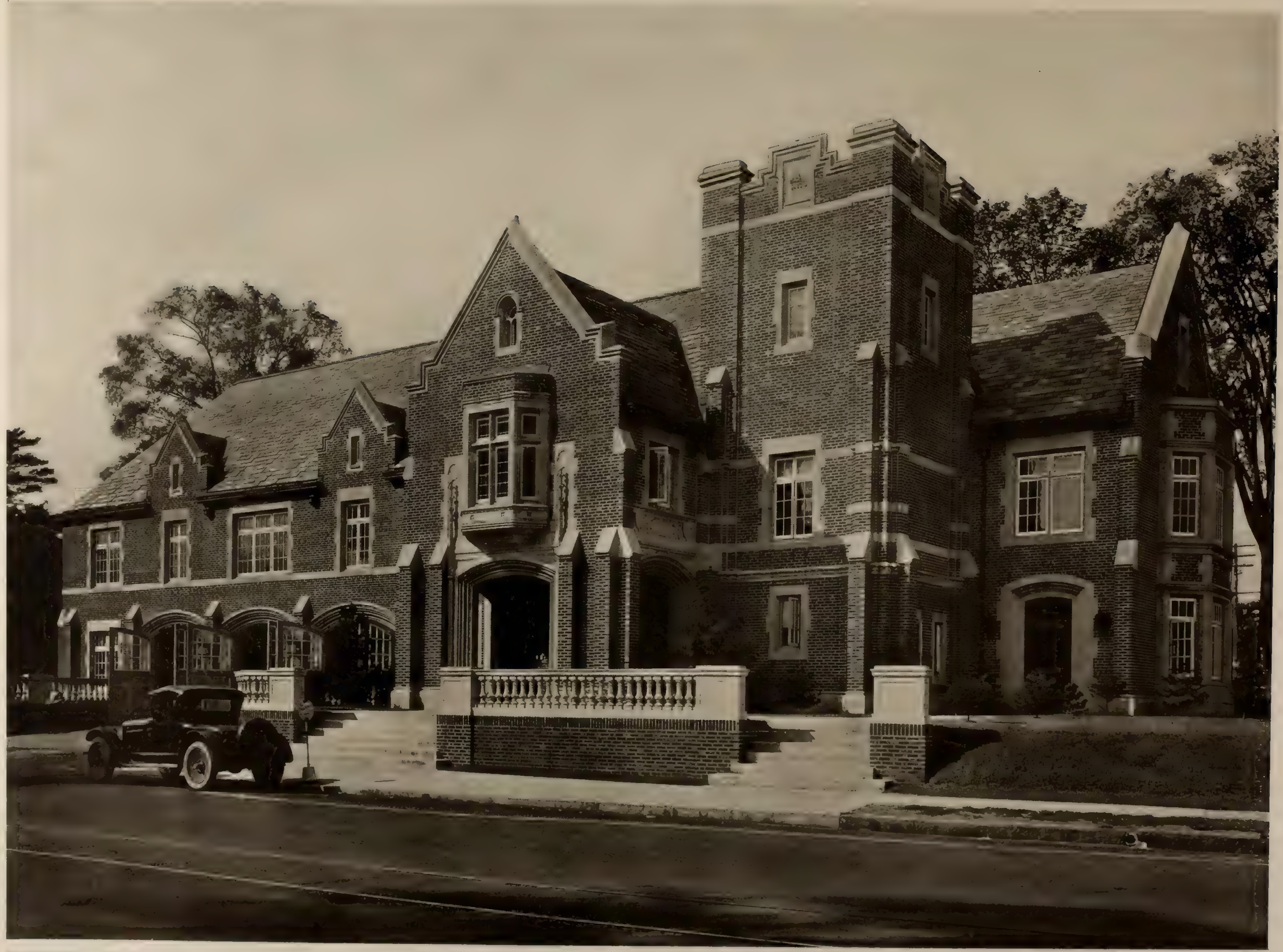
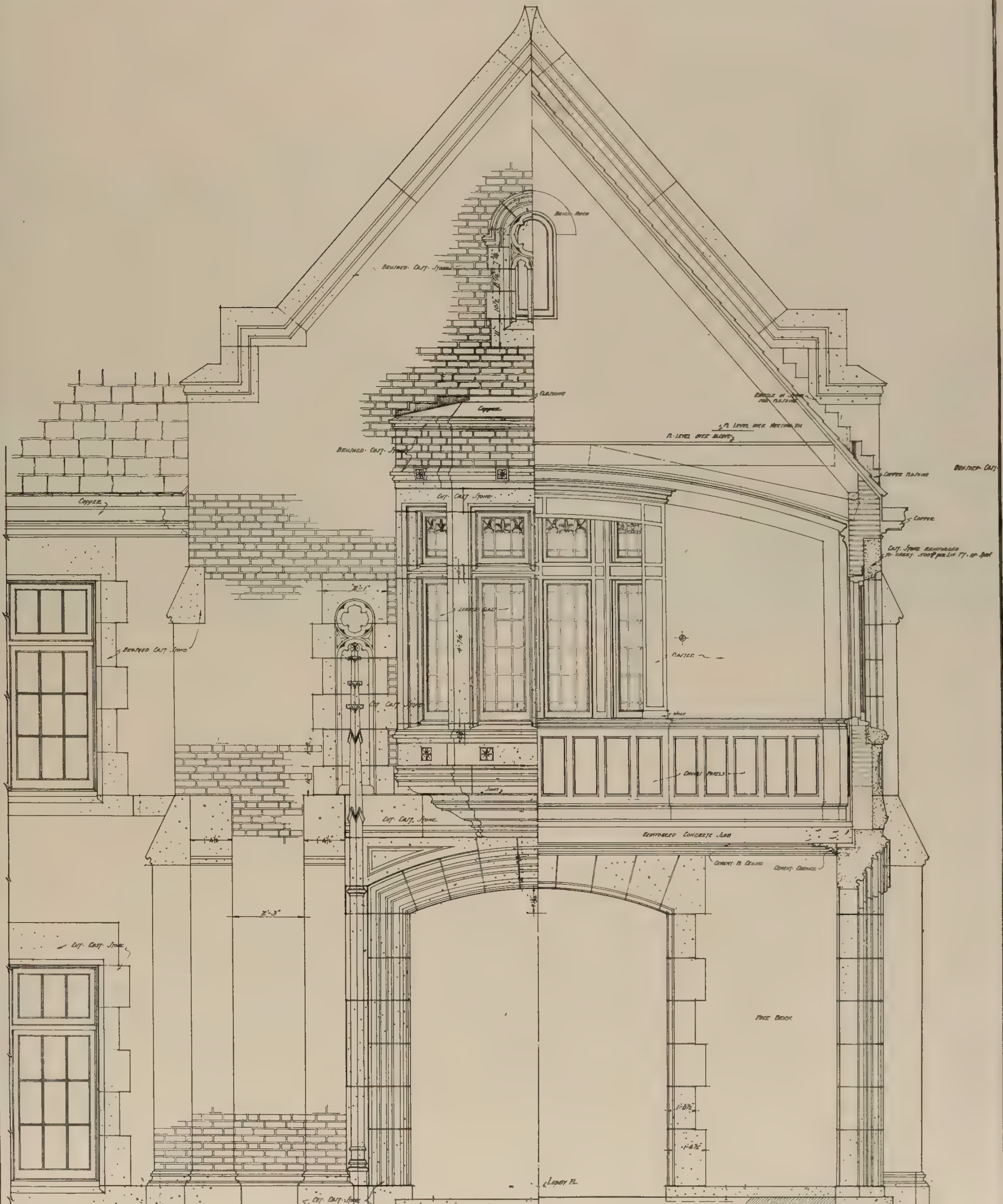


MUNICIPAL BUILDING, LARCHMONT, N. Y.

Frank A. Moore, Architect.



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·MAIN · ENTRANCE ~ ORIEL ~ GABLE ~ ALCOVE·

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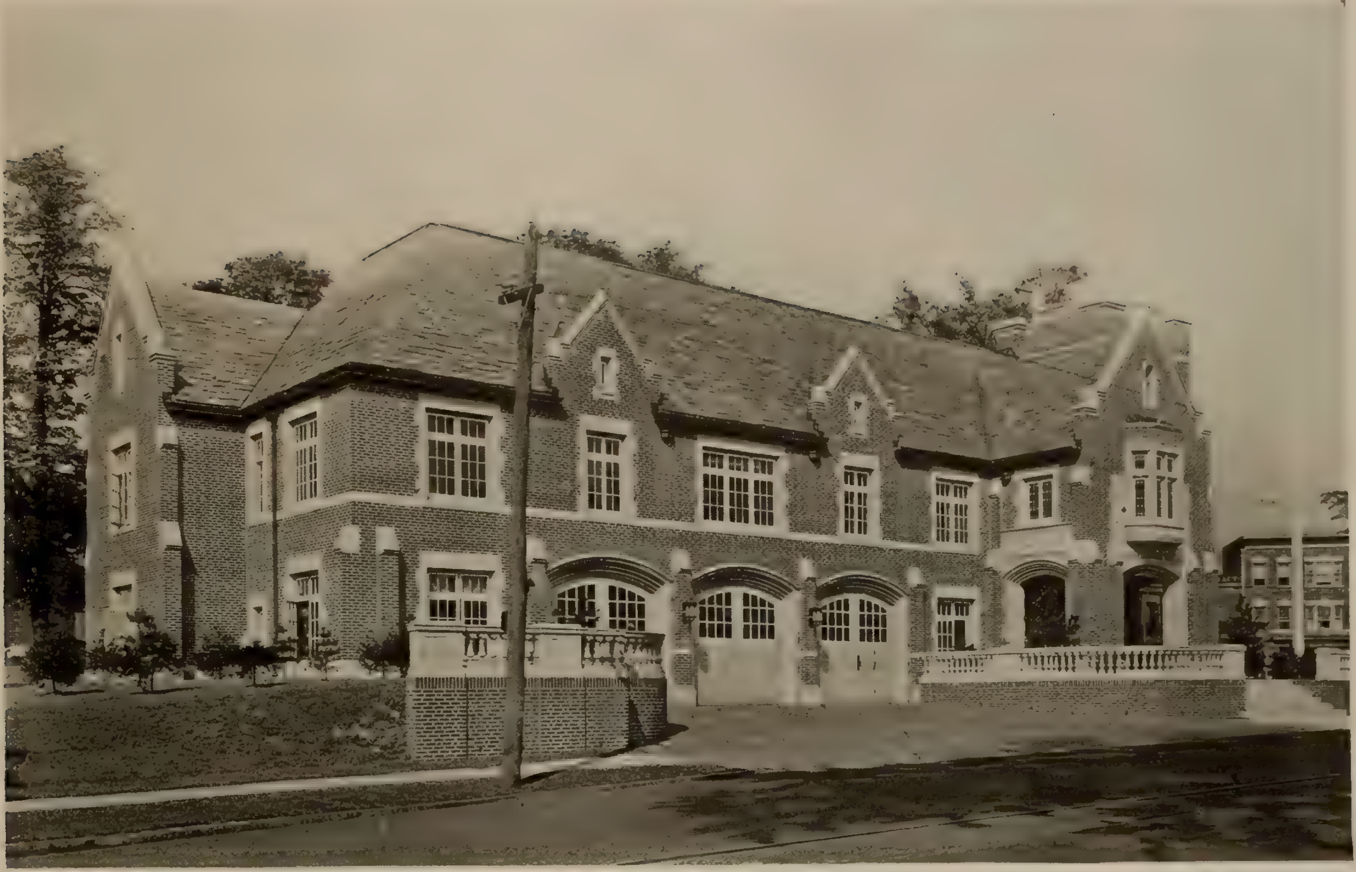
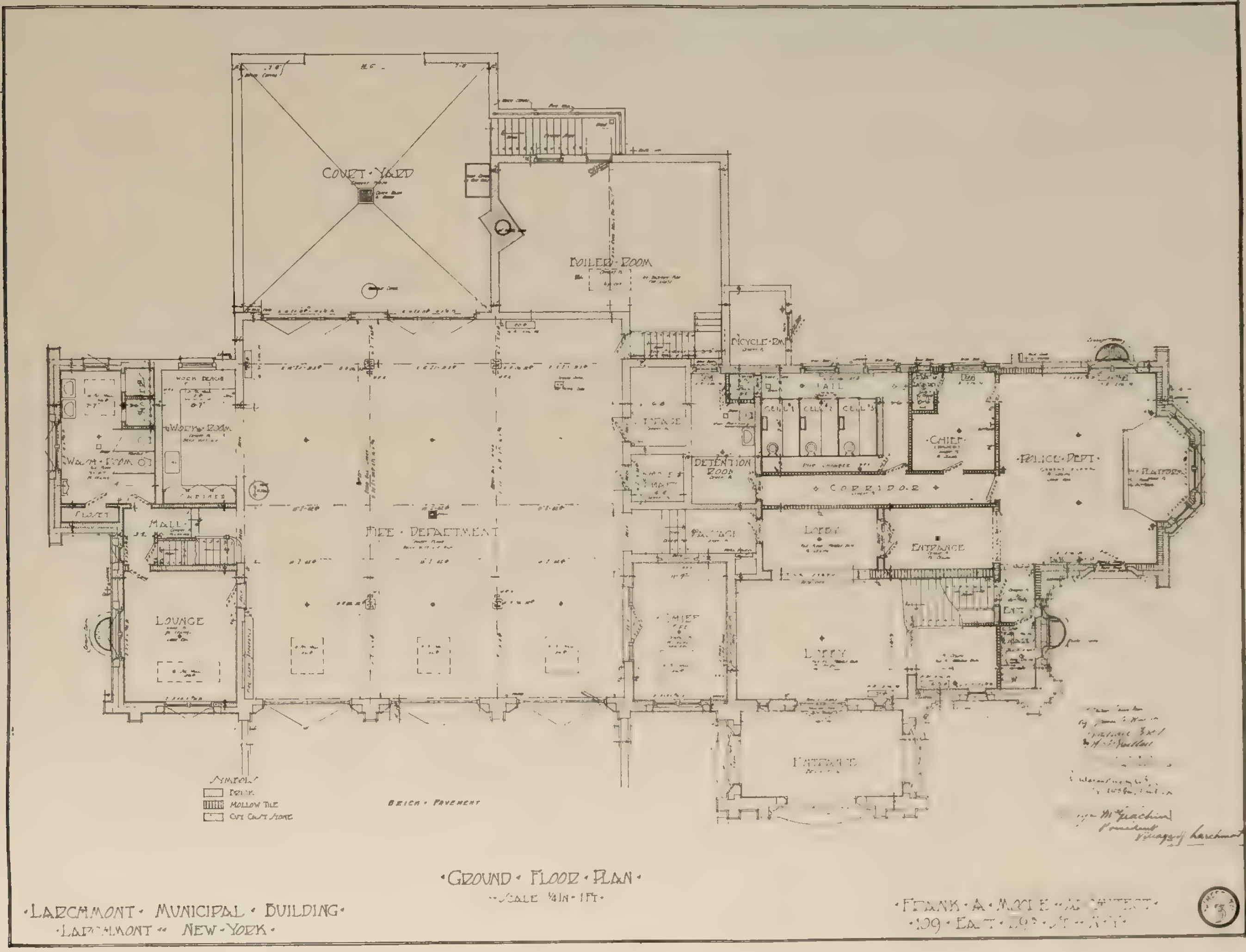
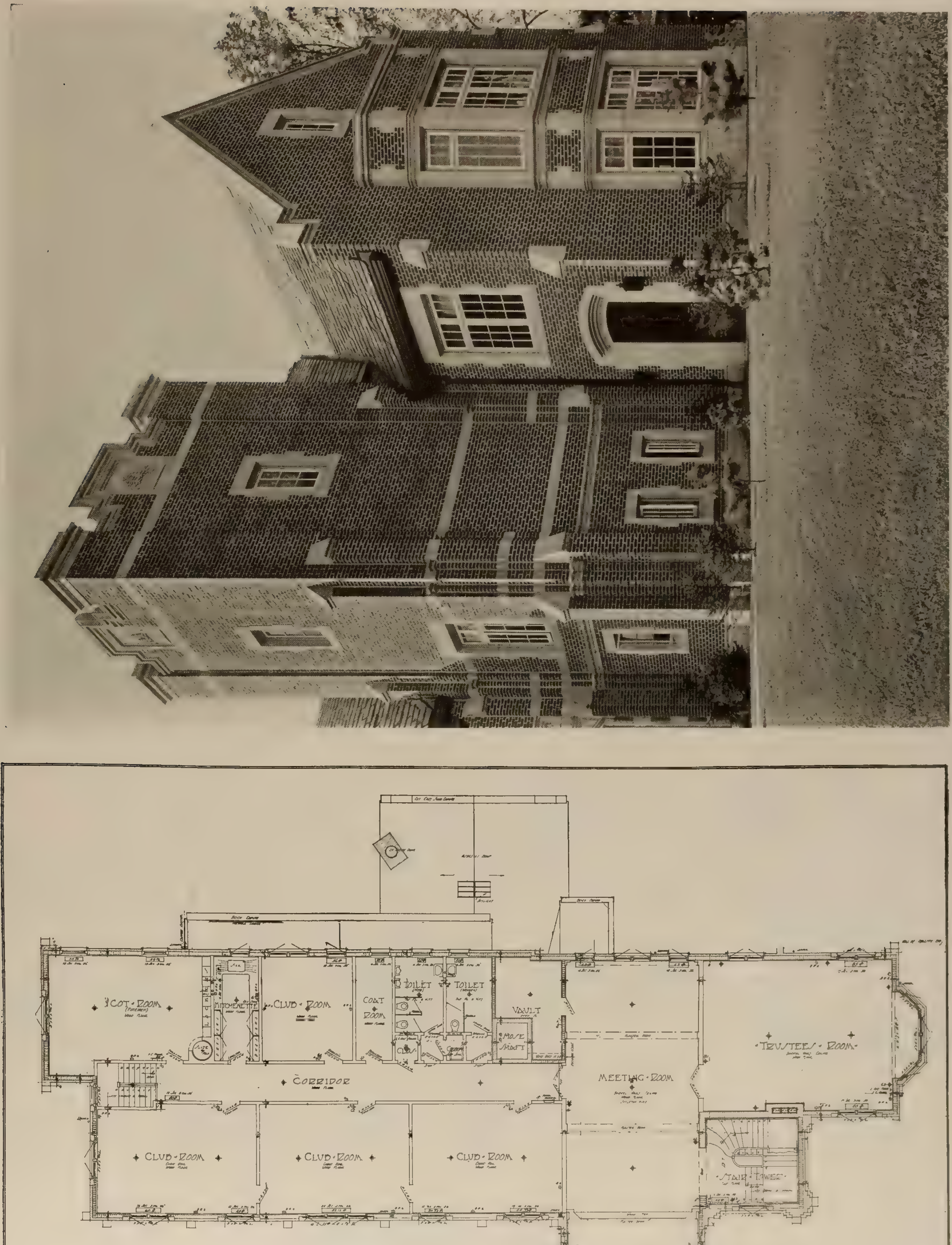
·LARCHMONT ~ NEW · YORK·

Frank A. Moore, Architect.

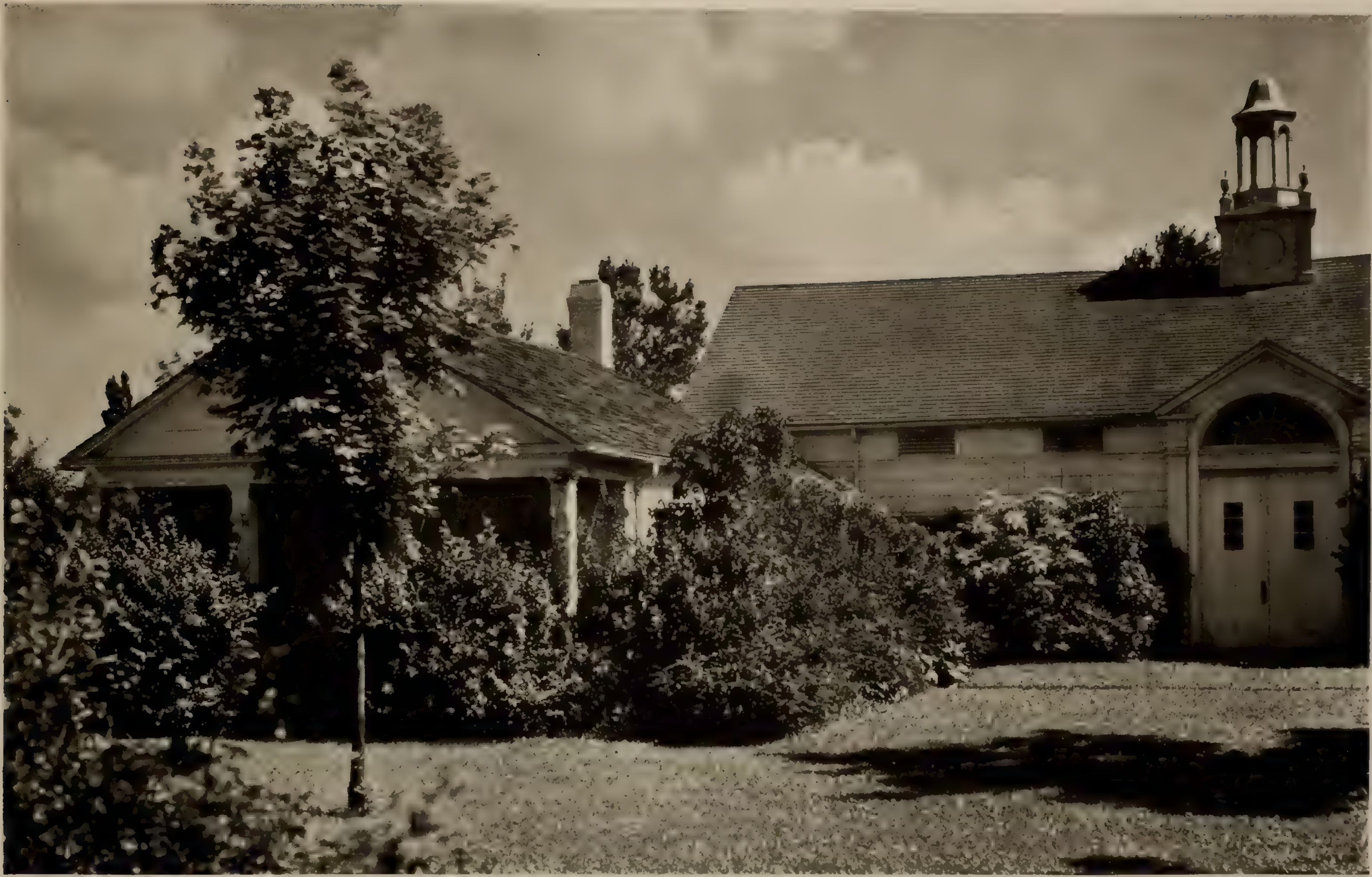


FIRE DEPARTMENT HEADQUARTERS.

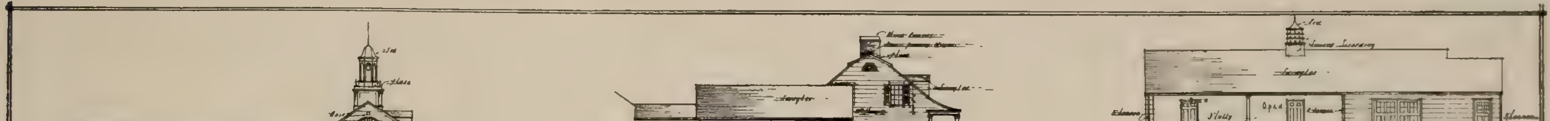




STAIR–TOWER AND POLICE DEPARTMENT WING, MUNICIPAL BUILDING, LARCHMONT, N. Y.
Frank A. Moore, Architect.

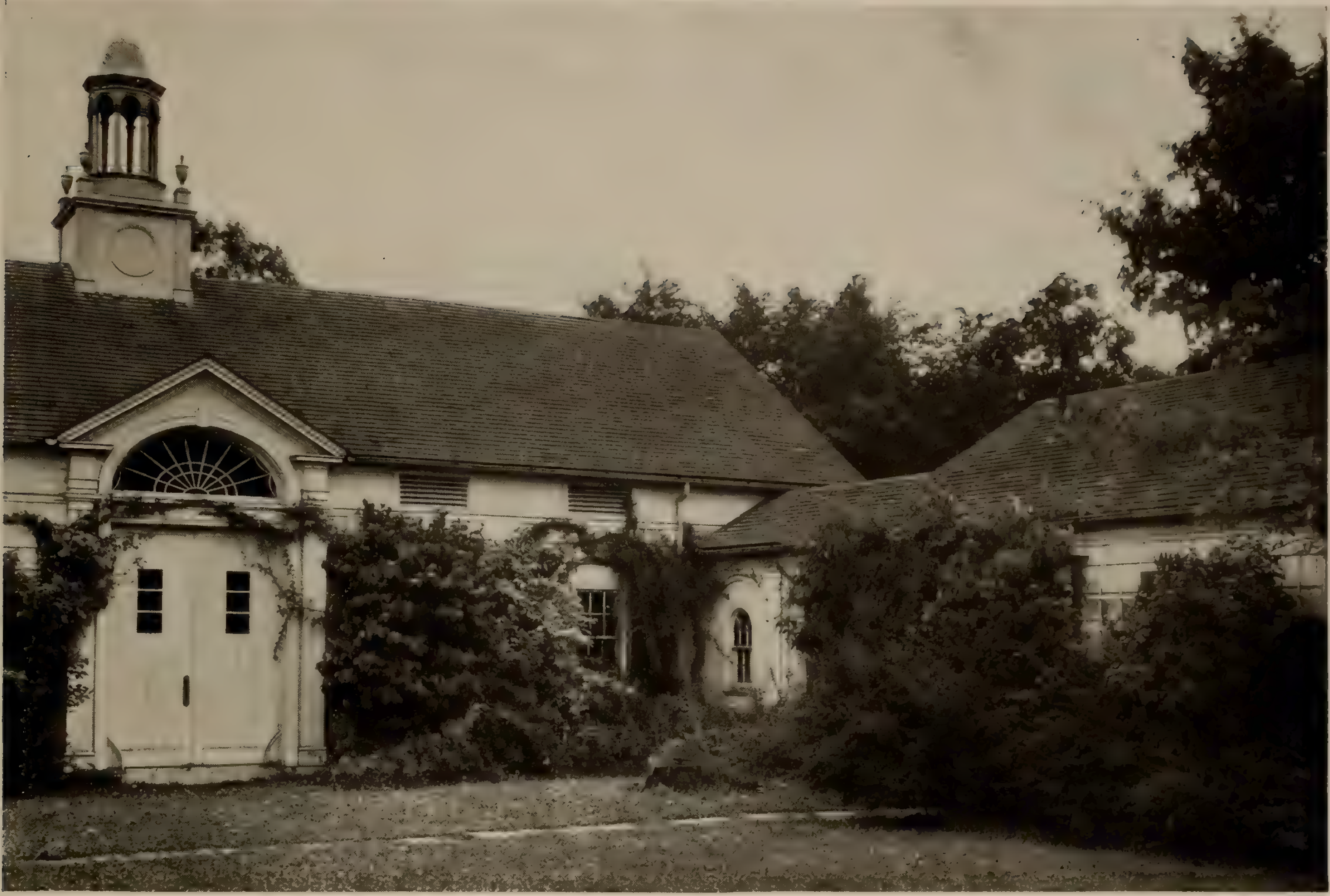


DAIRY AND HAY-BARN FROM CENTRAL COURT.

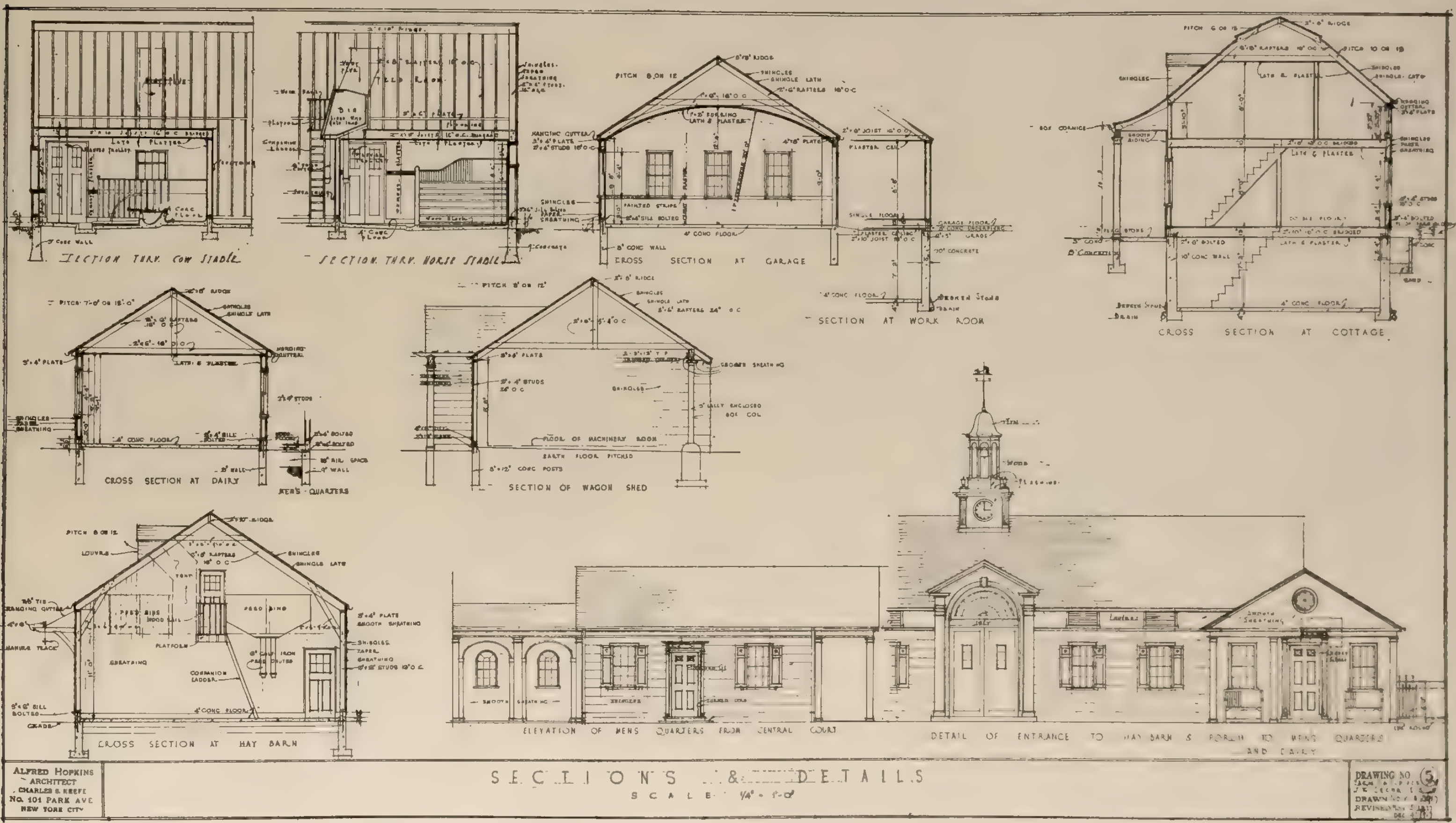


FARM GROUP FOR J. K. SECOR ESTATE, PERRYSBURG, OHIO.

Alfred Hopkins, Architect.



HAY-BARN AND MEN'S QUARTERS FROM CENTRAL COURT.



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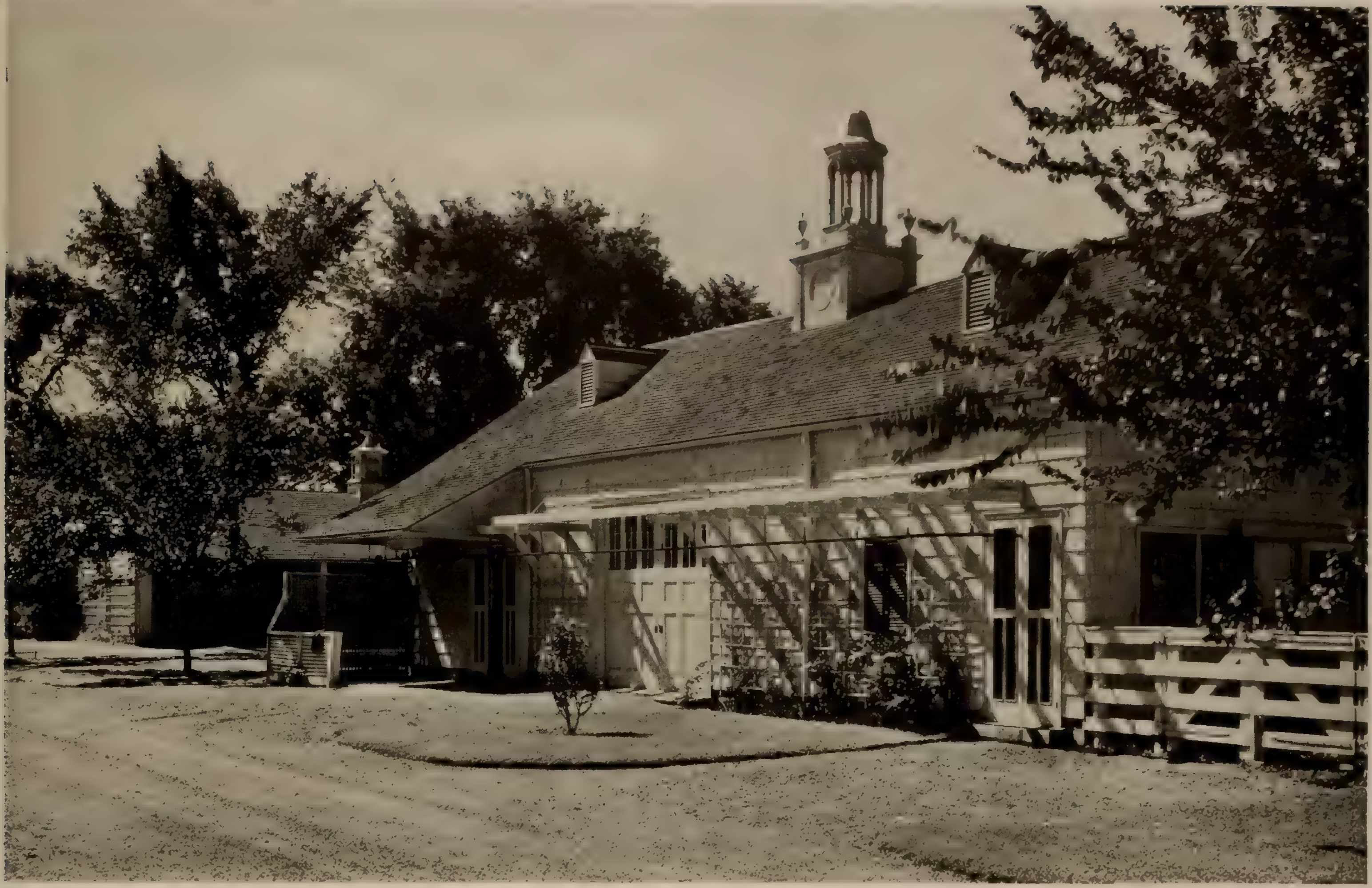
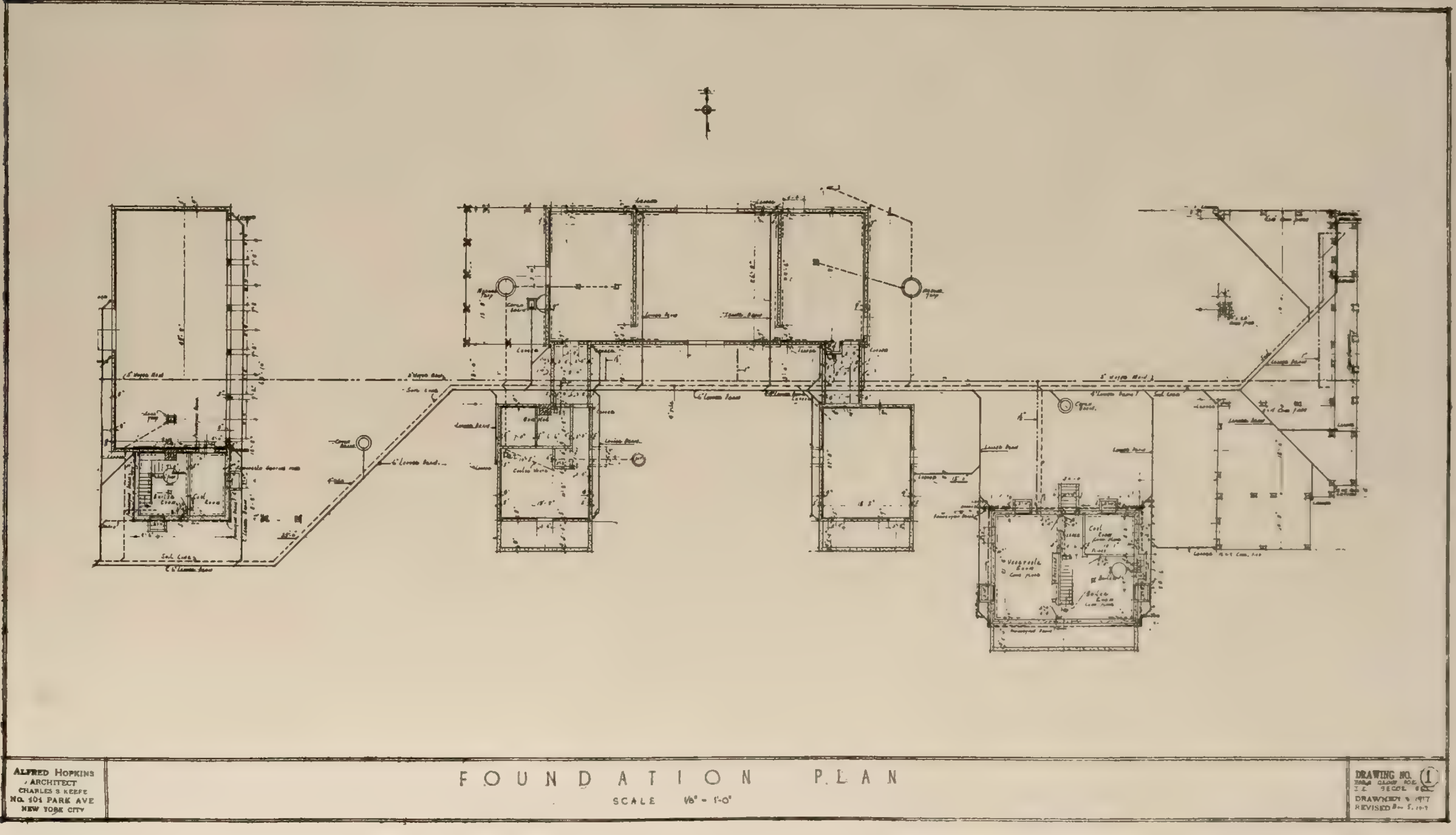
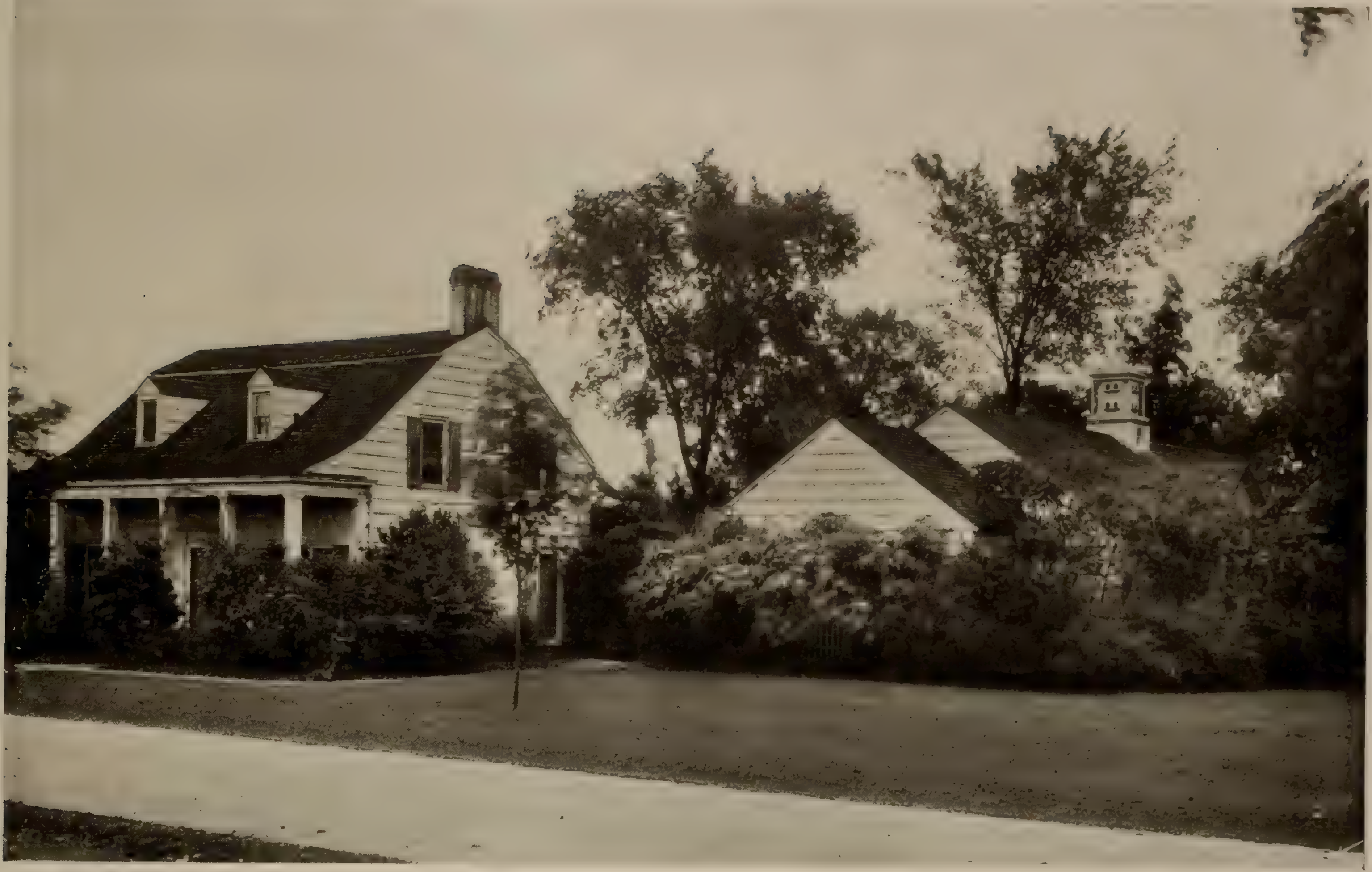


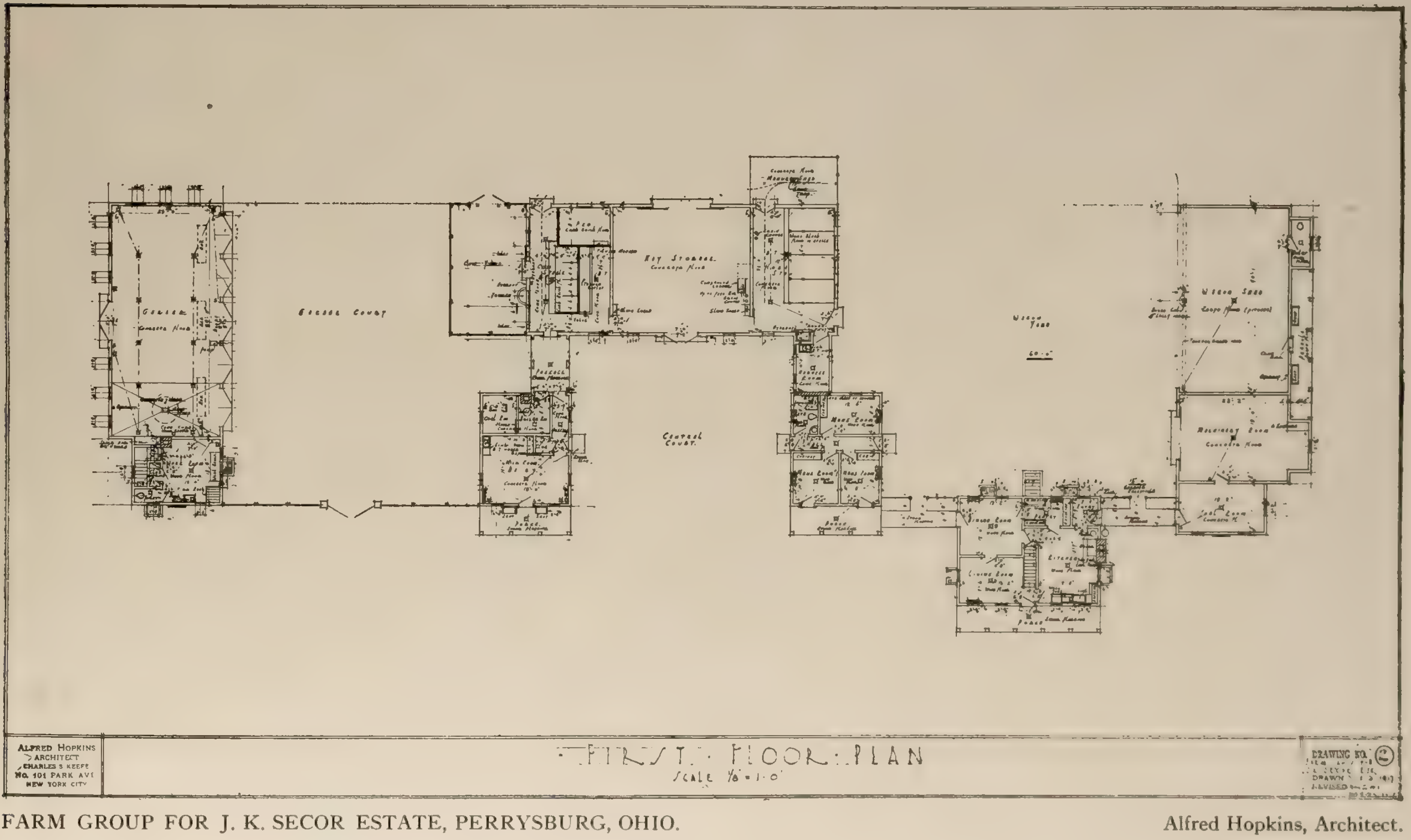
WAGON-SHED AND HAY-BARN.



FARM GROUP FOR J. K. SECOR ESTATE, PERRYSBURG, OHIO. Alfred Hopkins, Architect.

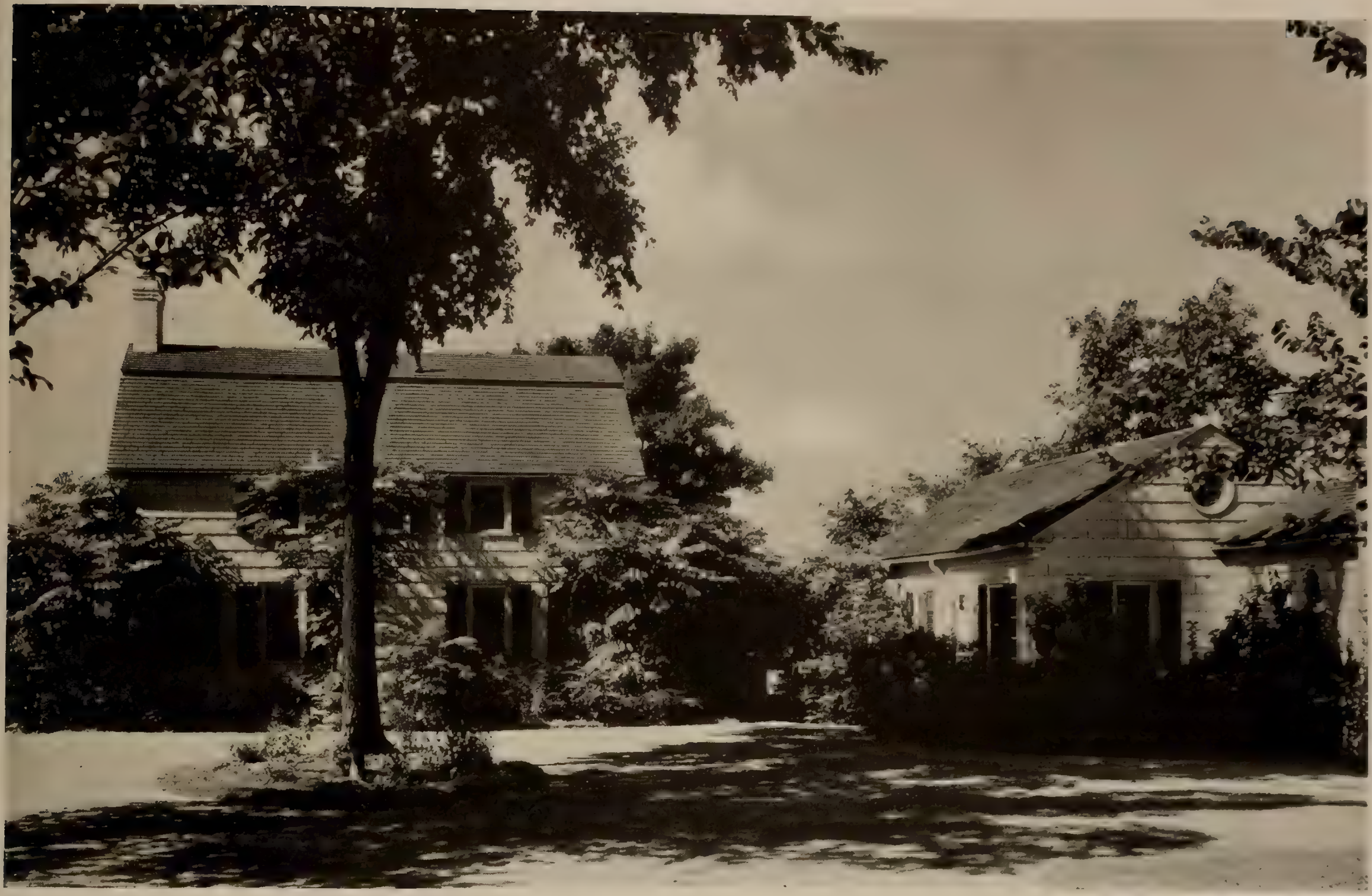


COTTAGE, TOOL-ROOM, MACHINE-ROOM, AND WAGON-SHED.

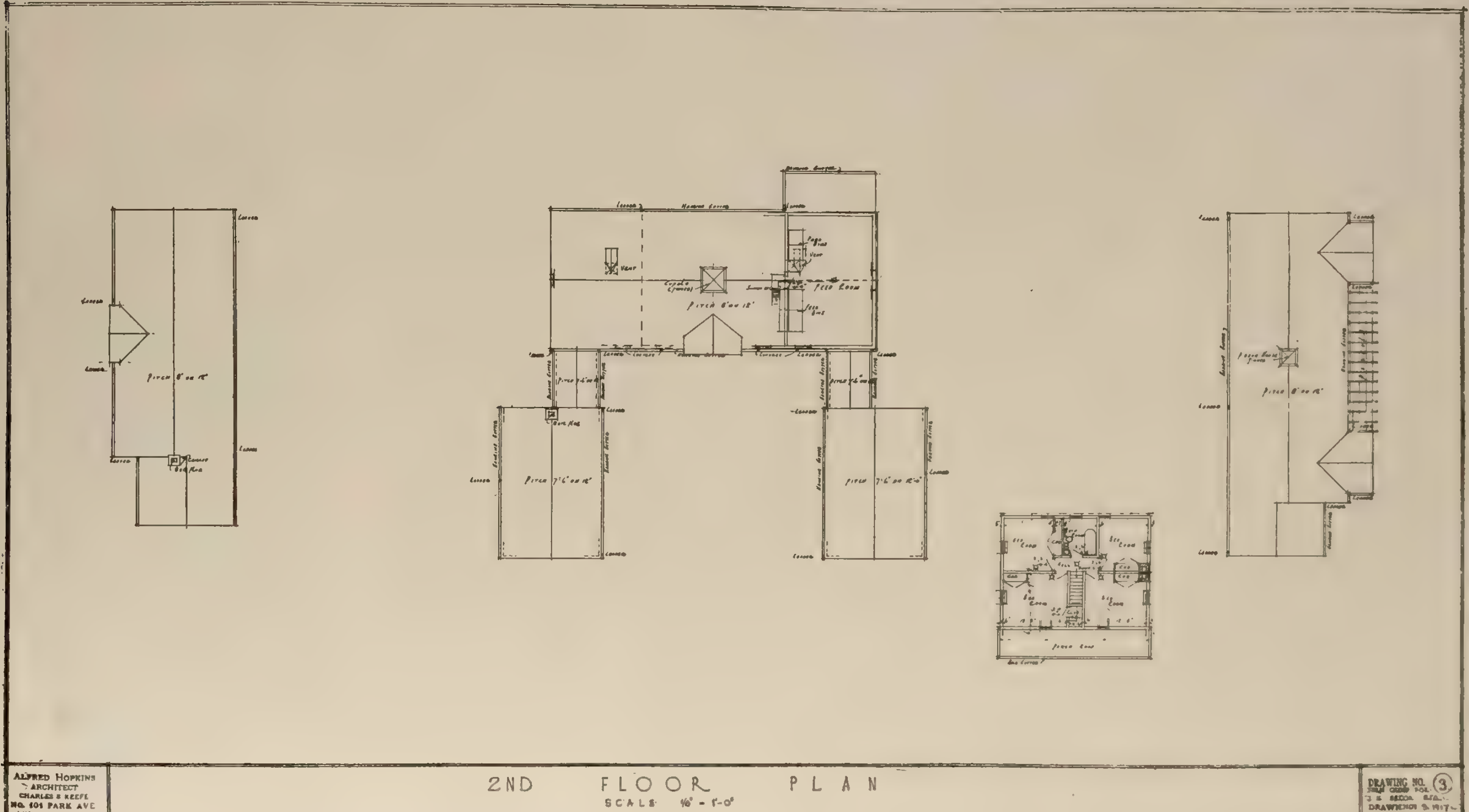


FARM GROUP FOR J. K. SECOR ESTATE, PERRYSBURG, OHIO.

Alfred Hopkins, Architect.



COTTAGE AND MEN'S QUARTERS FROM WAGON-YARD.



FARM GROUP FOR J. K. SECOR ESTATE, PERRYSBURG, OHIO. Alfred Hopkins, Architect.

Refrigeration for Hotels, Markets, and Dwellings

By John E. Starr, M.E.

SECOND ARTICLE

AMONG the accessories demanded by the present-day housing are appliances for refrigeration. It seems probable that for many years household refrigeration will continue to be accomplished largely as at present with the use of the "storage-battery" system of ice.

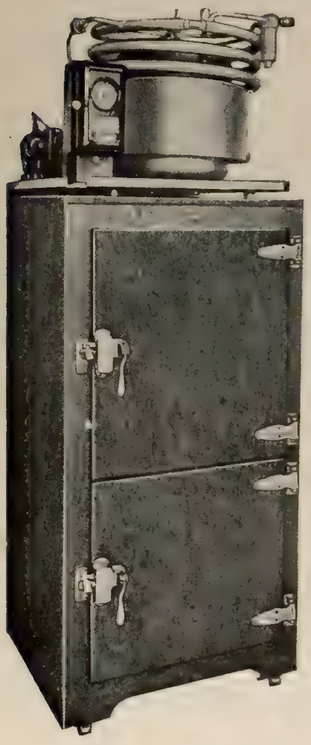
A small machine can be placed on top or at the side of a refrigerator.

The term "storage-battery" in this connection is merely to make use of the analogy between ice and the well-known electric storage-battery, which is simply a reservoir in which power is stored and heat or power is to be *given out*, and a chunk of ice is likewise a reservoir which *receives* heat or, in other words, produces refrigeration.

Ice is merely the subdivided representation of work already performed by nature or by a man-operated machine. A large machine is an instrument designed to take up heat. Most ice nowadays used in domestic refrigeration is simply part of a larger piece of matter out of which so much heat has been taken that it is in shape to take up more heat, or to refrigerate.

Of late years the plan of taking up heat directly in small quantities by a machine is considered, and in many cases it is feasible to do so.

The alleged advantages of the small-machine plan are that refrigeration can be attained at least as cheaply as by the storage-battery or ice method, and that heat can be taken up on a lower plane of temperature than by ice. It is also cleaner and avoids the visits of the iceman and general sloppiness.



A refrigerator with machine operated by gas. The machine can be cabinet-housed.

Whichever method is used, the object is the same, *i. e.*, the taking away of heat from the goods themselves and the taking away of heat that would otherwise reach the goods, to the end that the goods may always be kept "cool," or free enough from heat to preserve them—as it is well known that certain goods, when held below certain temperatures, will not spoil but remain practically "in statu quo," for a sufficient period.

As heat flows from the warm air or other surroundings through the walls of the container or refrigerator to the air inside of the same, and is carried by the air to the ice or other cold surface in the box, it follows that the same general principles attach to the container in both cases—*i. e.*, in both cases as much heat as possible must be prevented from reaching the air in the box.

This is done by building the walls of the box out of some kind of material that obstructs or resists the passage of heat. Such material is usually called "insulation," and in both cases should be good.

An apartment-house refrigerator and machine.

There is no material known that will entirely stop the passage of heat, but there are several that will obstruct its passage, and only allow a small portion of all the heat that reaches the wall of the box to pass through it.

In a family refrigerator fully 85 per cent of all the heat that does get through the insulated wall accounts for the heat that must be taken up, and if the inside temperatures are to be kept low: it makes no difference whether a machine or ice (which is a representative of the machine) is used.

The first attempt, therefore, should be to keep the passage of heat down to as low a point as possible—but there are limits. As soon as the interest, amortization, and upkeep cost on the insulated structure equals the refrigerating cost there is no further saving to be made.

It is unfortunately true that the majority of refrigerators now on the market are not made up with heat-resisting material on which the amortization, upkeep, and interest charge comes anywhere near the cost of taking up the heat that flows through their walls.

It would not be too much to say that they do not on the average approach the balance by one-half, and that the public are suffering an economic loss of millions of dollars every year, because they will not recognize that a cheap box or a goodlooking box may be inefficient as to the passage of heat. Probably this condition may always generally exist but the wise man will easily avoid it.

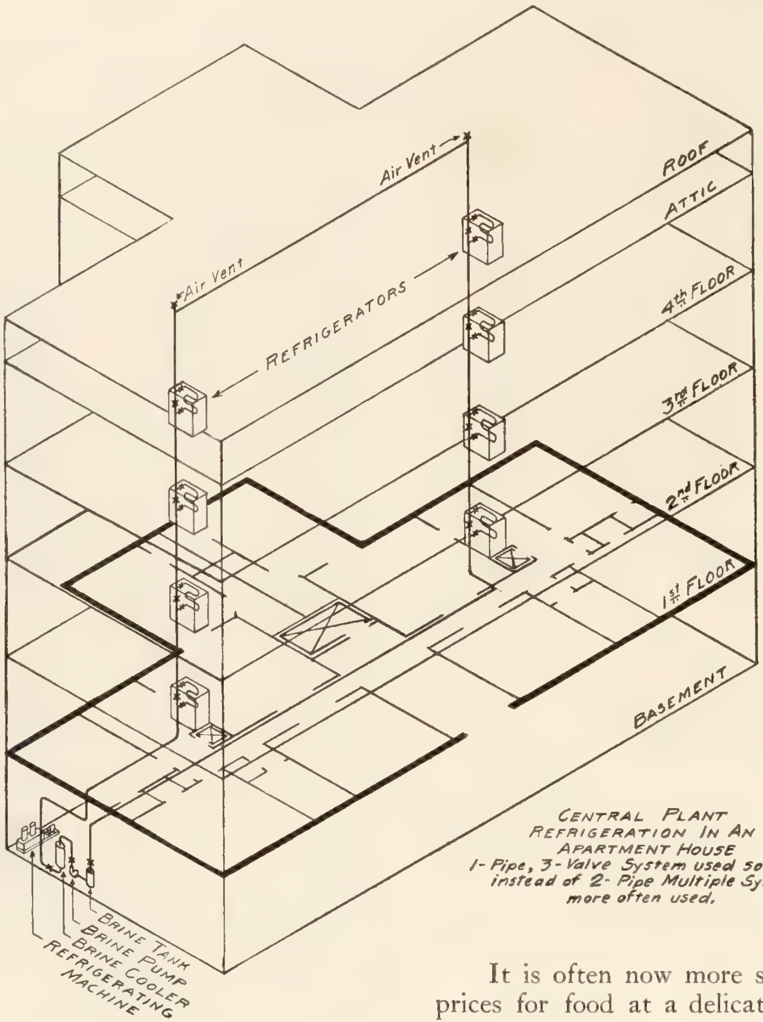
A little figuring will show that, considering the cost of refrigeration on the average at the present market for taking up heat on a small or household scale, the balancing-point is reached by providing an insulation (that can also be obtained at the present market price) that only allows 2½ Btu. of heat to pass per day of 24 hours per degree of difference between the outside temperature and the temperature ordinarily desired in the box.

Most refrigerators as at present sold will allow from 3.5 to 6 Btu. to pass per sq. ft. per day per degree of difference, so obliging the consumer to take care of more heat than is necessary, and to pay for his refrigeration of from 40 to 140 per cent more than is necessary; against which loss he has only to charge the few extra dollars that a well-insulated box would cost him over the cost of a poor one.

This reasoning applies equally to both methods of producing refrigeration, so the subject may be dismissed with the admonition to use good refrigerators in either case.

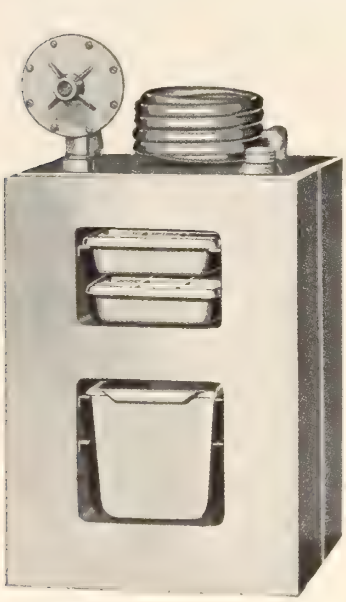
A good deal of the argument in favor of the machine method lies in the fact that the machines can make up for the deficiency of insulation because they will take up heat on a lower plane than ice. This is true, but it will cost more for a low temperature than a higher one, and why not avoid the extra cost by a provision that will be once for all?

Ice has been used for centuries in domestic refrigeration and a general description of how it is used is not necessary, except to say that as a rule it is badly used, and that its possibilities are not anywhere near realized in average practice.



Central Plant Refrigeration In An Apartment House
1-Pipe, 3-Valve System used sometimes instead of 2-Pipe Multiple System more often used.

The domestic refrigerating-machines of the present day are mostly miniatures of the larger machines, with only the added thermostat-actuated stoppers and starters, according to temperatures desired, so as to render them automatic; a feature not necessary in a large machine which runs continuously and has attendants to stop and start it if required.



A cooler placed in the space usually occupied by ice and connected by small pipes to a machine on top or at the side of refrigerator. The action of the machine keeps the entire surface cold—from 15 to 25° F.

The principal objection to the universal use of small machines is their first cost, a feature that as to the consumer does not enter in the use of ice. The use of a refrigerator or food-container is common to both.

The total cost of refrigeration for a period of years covering the life of the machine is its first cost plus the interest on the use of the cost money plus the cost of operation plus the cost of repair. The first cost of the machine, when added to the cost of operation and repair at the present time, is often more than the cost of ice for refrigeration, and hence its use is largely confined to people who place a value on the alleged advantages over ice and to people who possess cash enough to invest in one.

Most of them run at a less operating cost than the use of ice would cost, but with even the best of them, the period of amortization of the first cost and interest out of the savings of operation over ice cost is too great a period for the average consumer to contemplate. Many machines are purchased as a luxury by people that can afford it, and to whom the character of the refrigeration expected is of more value than the actual cost on an ice basis. Others may use the machine in localities where it is difficult to get ice with regularity.

Many people prefer to buy service in the same way they buy food.

It is often now more satisfactory to pay two or three prices for food at a delicatessen than to buy flour by the barrel and sugar by the sack, as people used to do in our boyhood days.

Again, the average user of refrigeration seldom sees at one time the $175 or $200 necessary to buy a machine, and if he did, the chances are that he would buy an automobile instead, as long as there was another though possibly more expensive way to satisfy his refrigerating needs. So they buy ten or fifteen cents' worth of refrigeration at a time, instead of investing a large lump at once.

Still, the household machine has to be considered as a possible accessory to the housekeeping menage. It is like a great many household accessories, and perhaps hardly comes under the purview of the architect.

There is, however, another method of supplying refrigeration, especially in apartment-houses, which properly comes into the architect's realm; hence the architect should know something on the subject in order to decide what is best for his client.

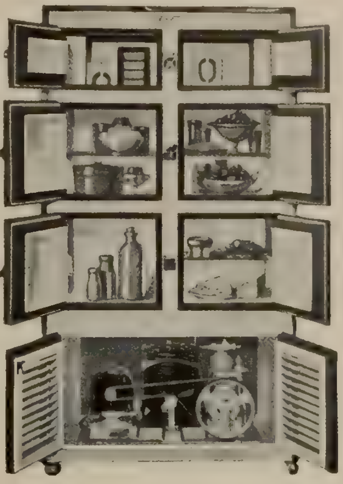
The various subdivided household areas in an apartment-house can, of course, be supplied with refrigeration in the same manner as has been heretofore treated of for hotels and markets, and the same principles apply.

The general arrangement of such a system is shown in diagram above.

The unit-machine system, or a small machine for each refrigerator, suggests one possible disadvantage that must be looked into when apartment-houses are considered. Most household refrigerating machines now on the market are operated by electric motors. The "whir" and slight vibration of one small motor in one dwelling might not be objectionably noticeable, but the installation of fifteen or twenty small motors in one building (usually built on steel frame) might cause objectionable noise or vibration if all were operating (as they might be) at the same moment. This may not be an insuperable objection, but is worthy of thought.

The objection to a central refrigerating-machine operating a number of boxes in an apartment-house lies in the possible cost of operation.

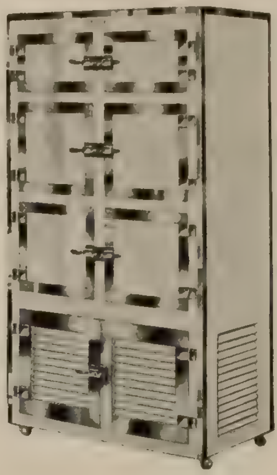
If the house is large enough or the circumstances are such that a more or less skilled engine-man is wanted in any event on the premises, it will usually cost no more for labor if a refrigerating-machine is placed in his care, but where a skilled man is obliged to be kept on the pay-roll simply because there is a refrigerating-machine in the list of house appliances, the cost of such a man might cause the refrigeration to cost more than by the ice method, and the tenants or the landlord might not wish to shoulder this cost. Sometimes the local law calls for a licensed engineer to be in charge.



A family refrigerator and machine.

So the architect who has to shape up his plans to meet the requirements of either kind of service must take into consideration the particular circumstances likely to exist at each building.

It is difficult to predict what the future trend will be as to the method of household refrigeration.



At the present time our advertising columns contain considerable matter setting forth the advantages of mechanical household refrigeration and considerable sales in money magnitude are being made by responsible concerns of refrigerating appliances, but not over $1\frac{1}{2}$ per cent of the entire refrigerating demand as it exists to-day has been touched, as it must be remembered that a present sale of apparatus represents the refrigerating demand for many years to come on account of the cost of apparatus.

The history of the next few years only will prove or disprove the speculations of to-day.

The best position for the architect to take, if he is called upon to provide for household refrigeration, is to provide for a good refrigerator in accordance with the sound principles of refrigeration.

Such a refrigerator will answer the requirements of either or any method.

Announcements

Gilbert J. P. Jacques, of Windsor, Ontario, and A. Stuart Allaster, formerly of Brockville, Ontario, have formed a partnership under the firm name of Jacques & Allaster, registered architects, with offices at No. 3 Ouellette Avenue, Suite 108, Windsor, Ontario.

Adams & Adams, architects, San Antonio, Texas, have moved from 517 Gibbs Building to 701 Builders Exchange Building, San Antonio, Texas.

W. W. La Chance has severed his connection with the firm of White & La Chance, architects, Niagara Falls, and has opened offices in the Niagara Trust Company Building in Niagara Falls, N. Y., and will be glad to have catalogues from all manufacturers interested in school-building materials and equipments.

F. H. Koenigsberger, architect, announces the removal of his offices to 48 Walnut Street, Newark, N. J.

Ronald W. Catto, B.A.Sc., R.A.I.C., O.A.A., and Douglas E. Catto, B.Arch., who have been associated in the practice of architecture under the firm name of Ronald W. Catto, Registered Architect, 47 King Street West, Toronto, announce the formation of a partnership. They have moved their offices and will continue practice under the firm name of Catto & Catto, Architects, Brock Chambers, 200 Bay Street, Toronto 2, Ontario.

Philip S. Tyre, R. A., announces his removal from 1509 Arch Street to 114 South Street, Philadelphia, Pa.

The Beauty of Old Age

Of course, youth has a beauty that belongs to itself, but old age, to those wise enough to see it, has beauty also.

Take the new French villages built in the war area, and compare them with the old villages in, say, Touraine.

The architecture is much the same, yet the new villages repel and the old ones attract.

The explanation is that the old buildings have been softened by the weather. They show that they have had experience. The roofs undulate. The colors are softer. One feels in looking at them that a great architect has been at work.

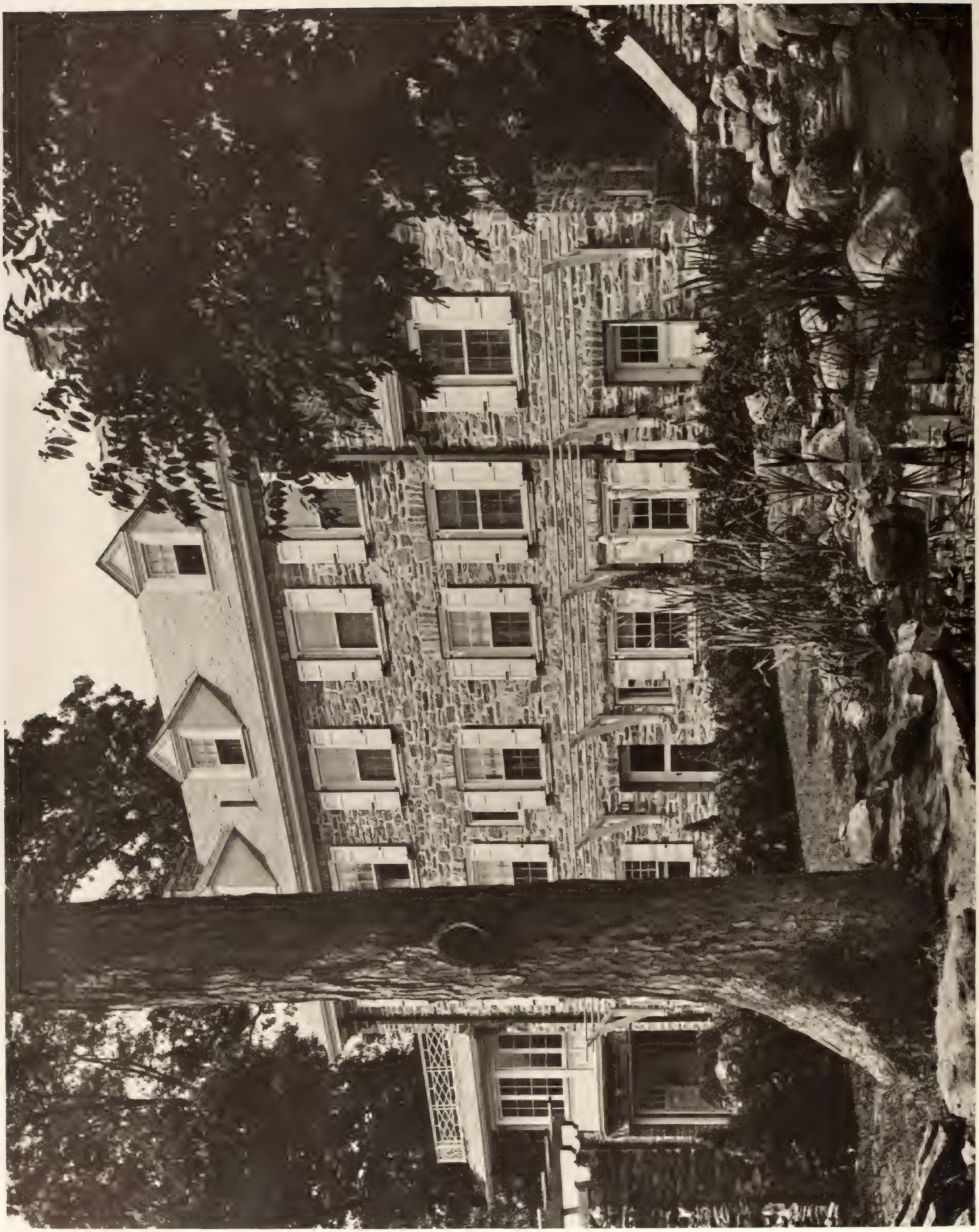
Travel through what is called the château country of France, the valley of the Loire, and you will worship the beauty that is expressed in the palaces, but you will also find your heart going out to the beauty that is expressed in the villages where the common people lived who provided the money to support the luxury of the châteaux.

This is a country that should be visited by every architect who desires to perfect his art. Even if it is necessary to make sacrifices in order to take the trip, the sacrifices will turn out to be not sacrifices at all. The rewards of the trip will be great.

Here you will find palaces where expense was no object, and right near them will be small houses built by poor people, for poor people, which have their own special beauty, and are every bit as charming as the homes of the rich.

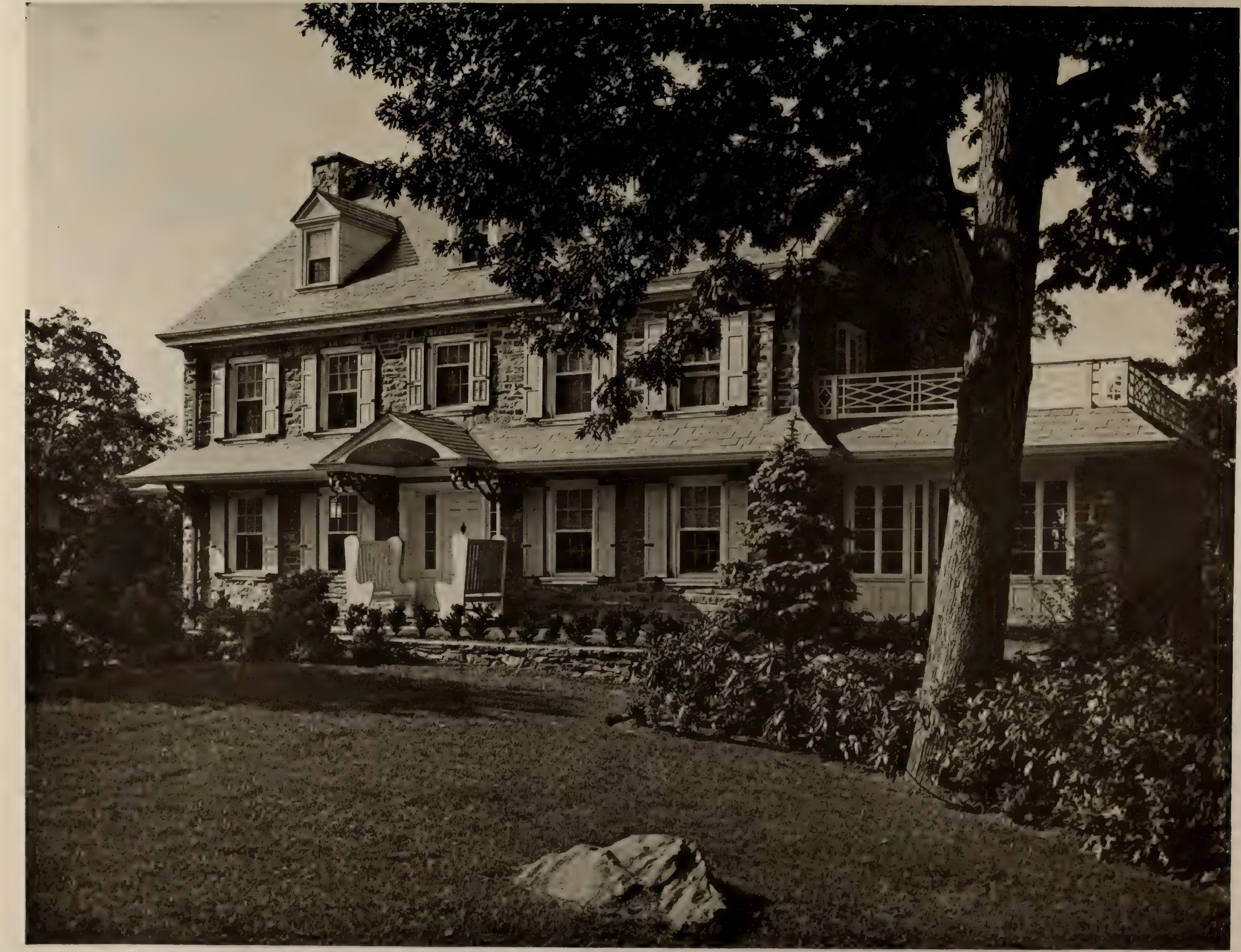
One knowing something of the histories of the people who lived in châteaux wonders if, after all, the dwellers in the little homes did not have the better life.

—*The Engineer.*



GARDEN FRONT, RESIDENCE, FRANK A. HOLBY, BEECHMONT, NEW ROCHELLE, N. Y.

William Whitehill, Architect.



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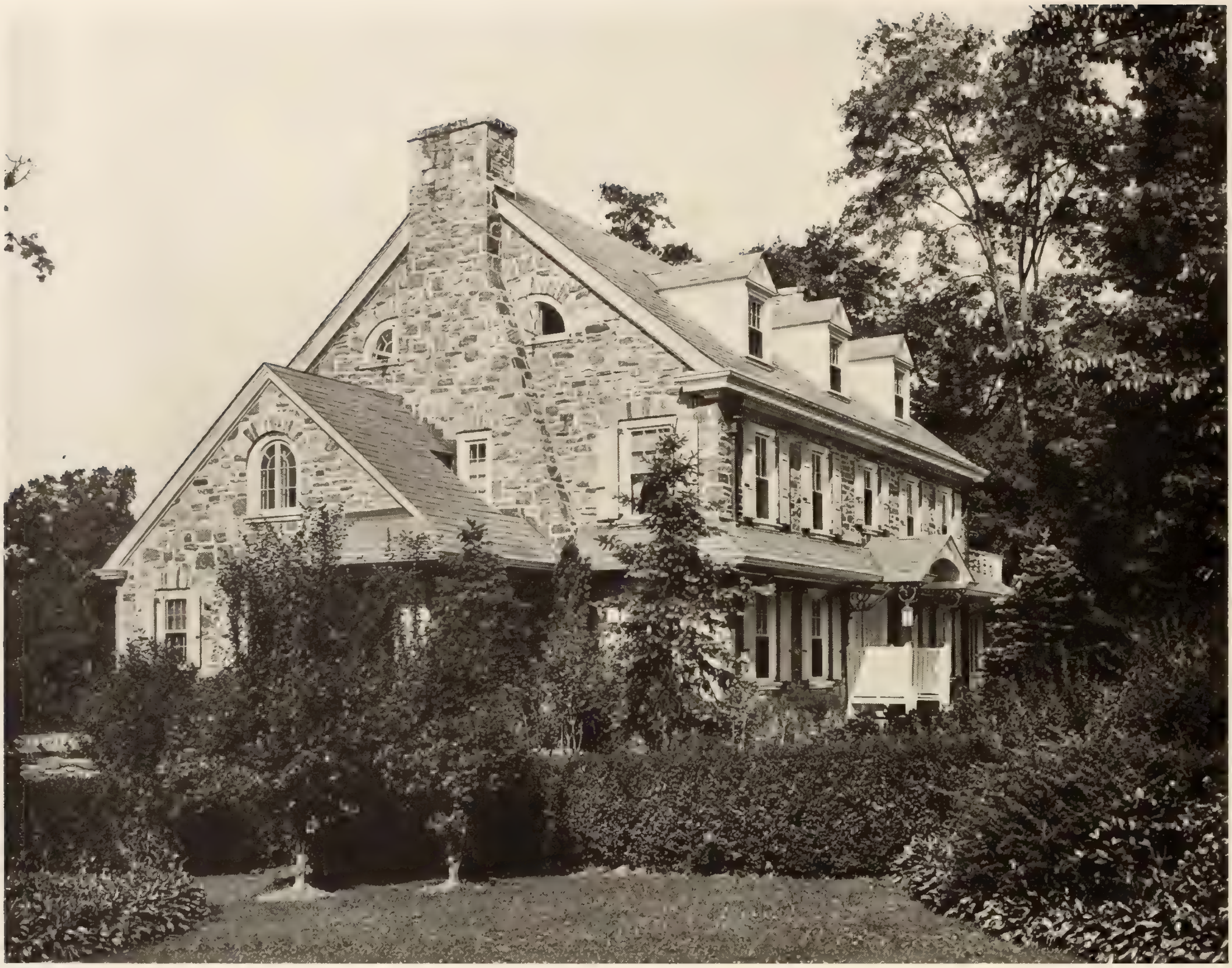
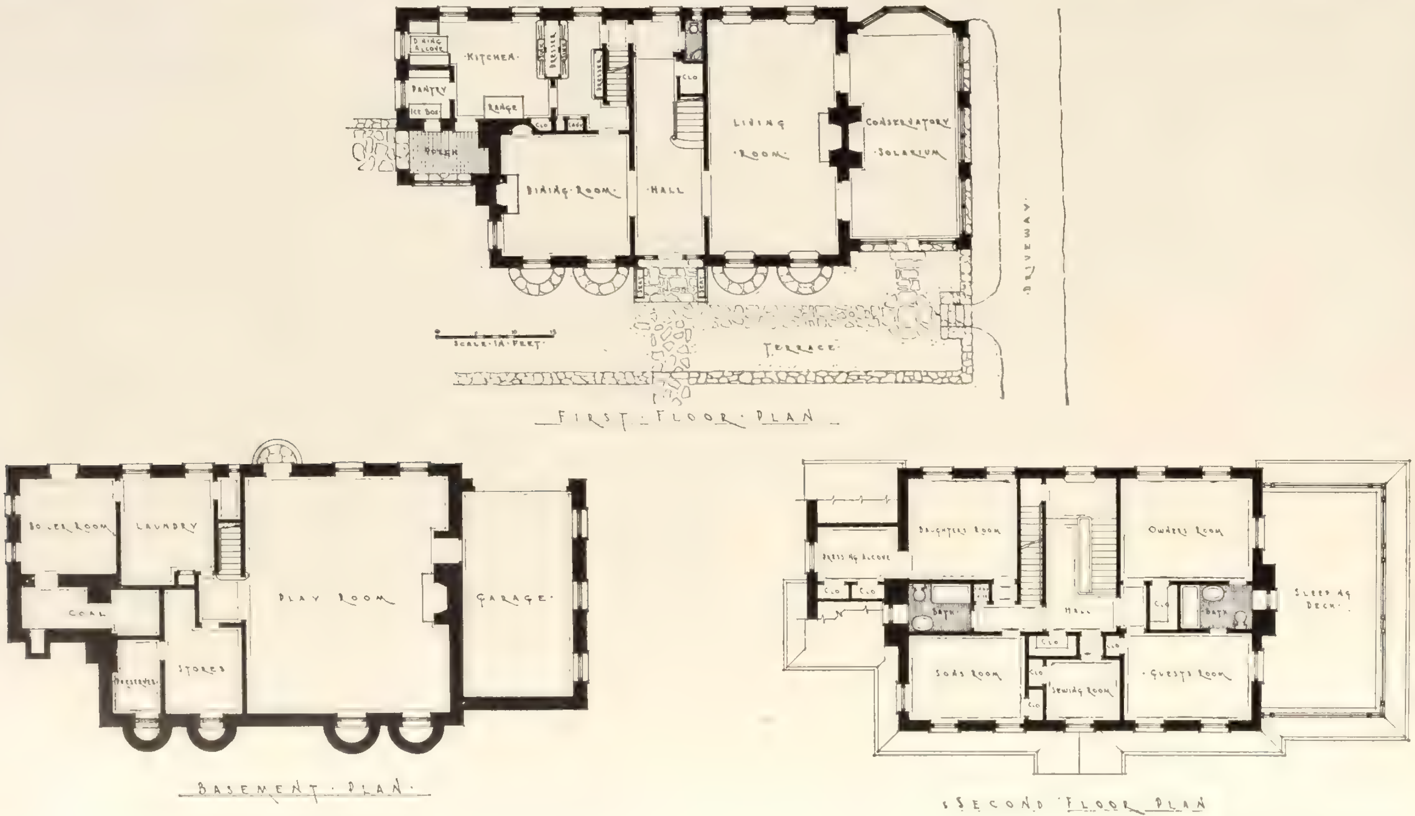


DETAIL.



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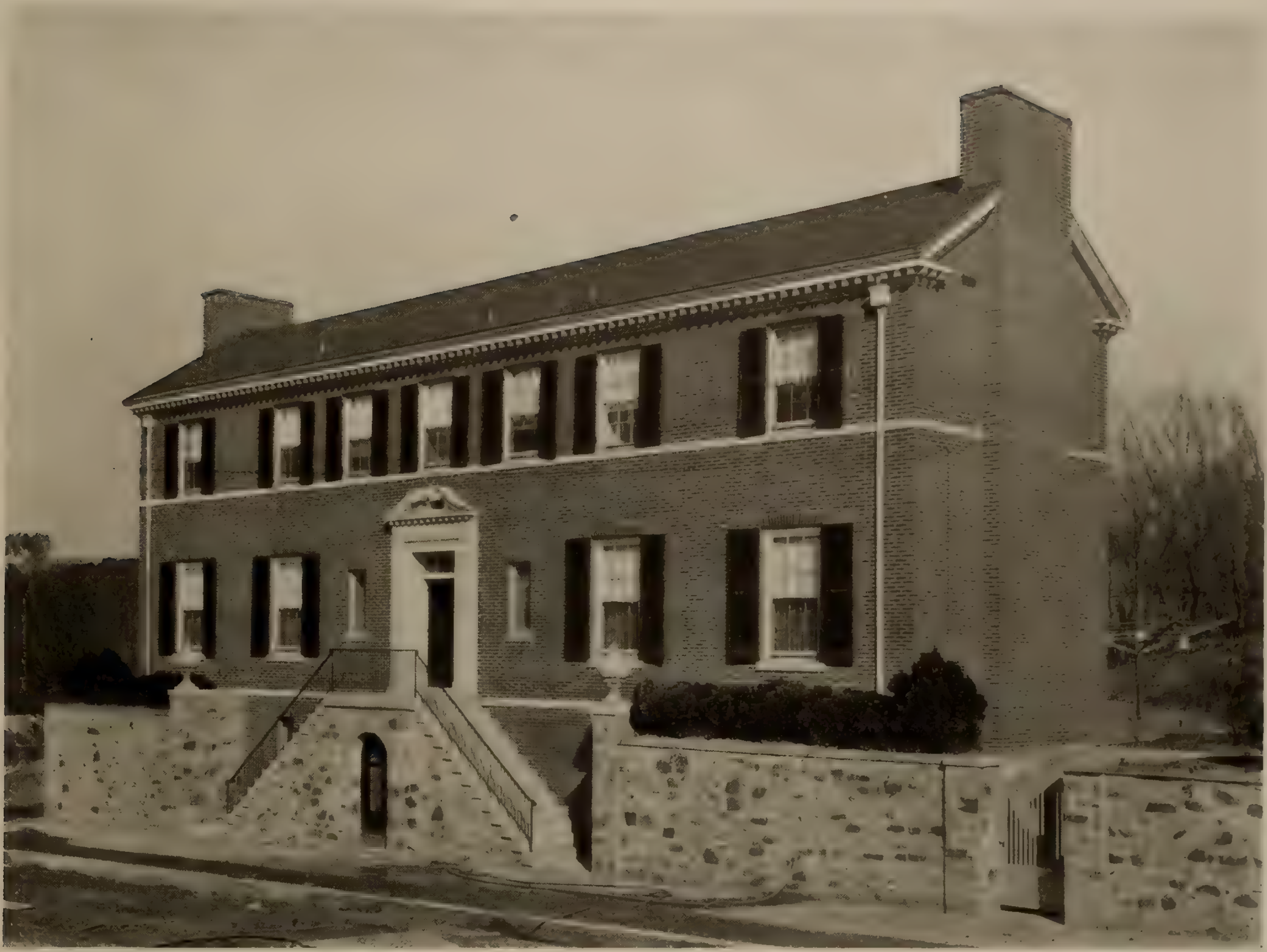
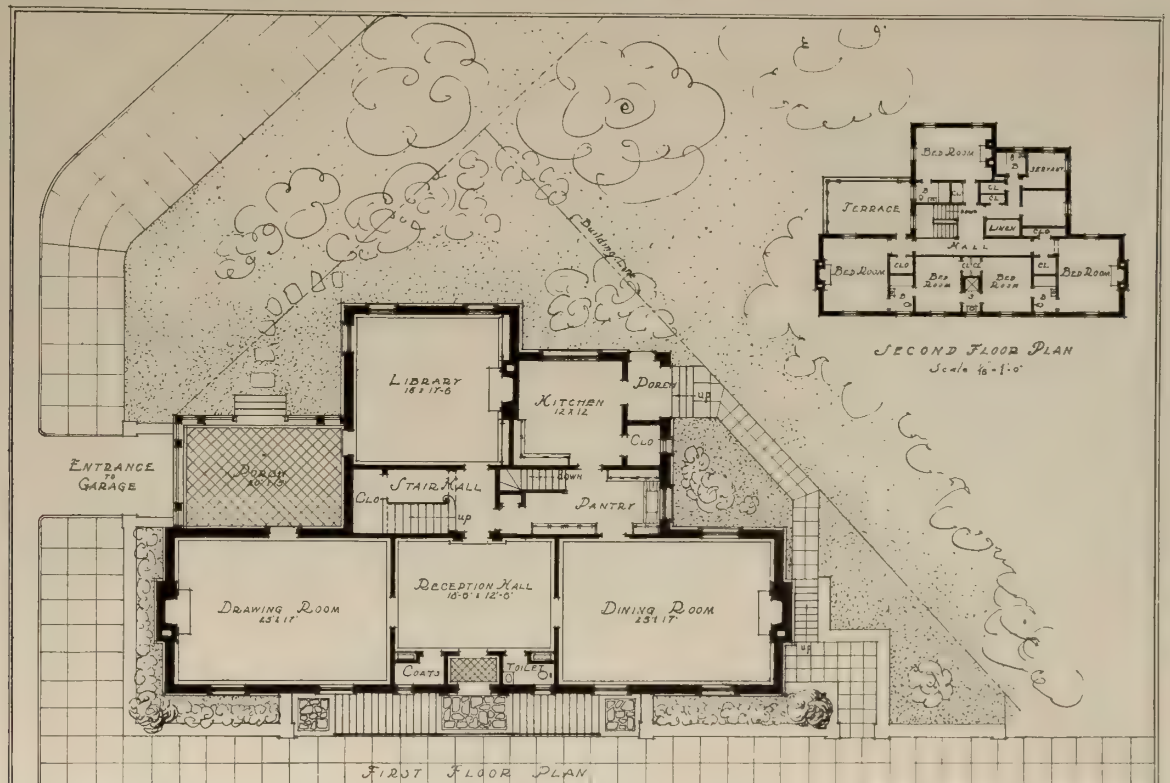
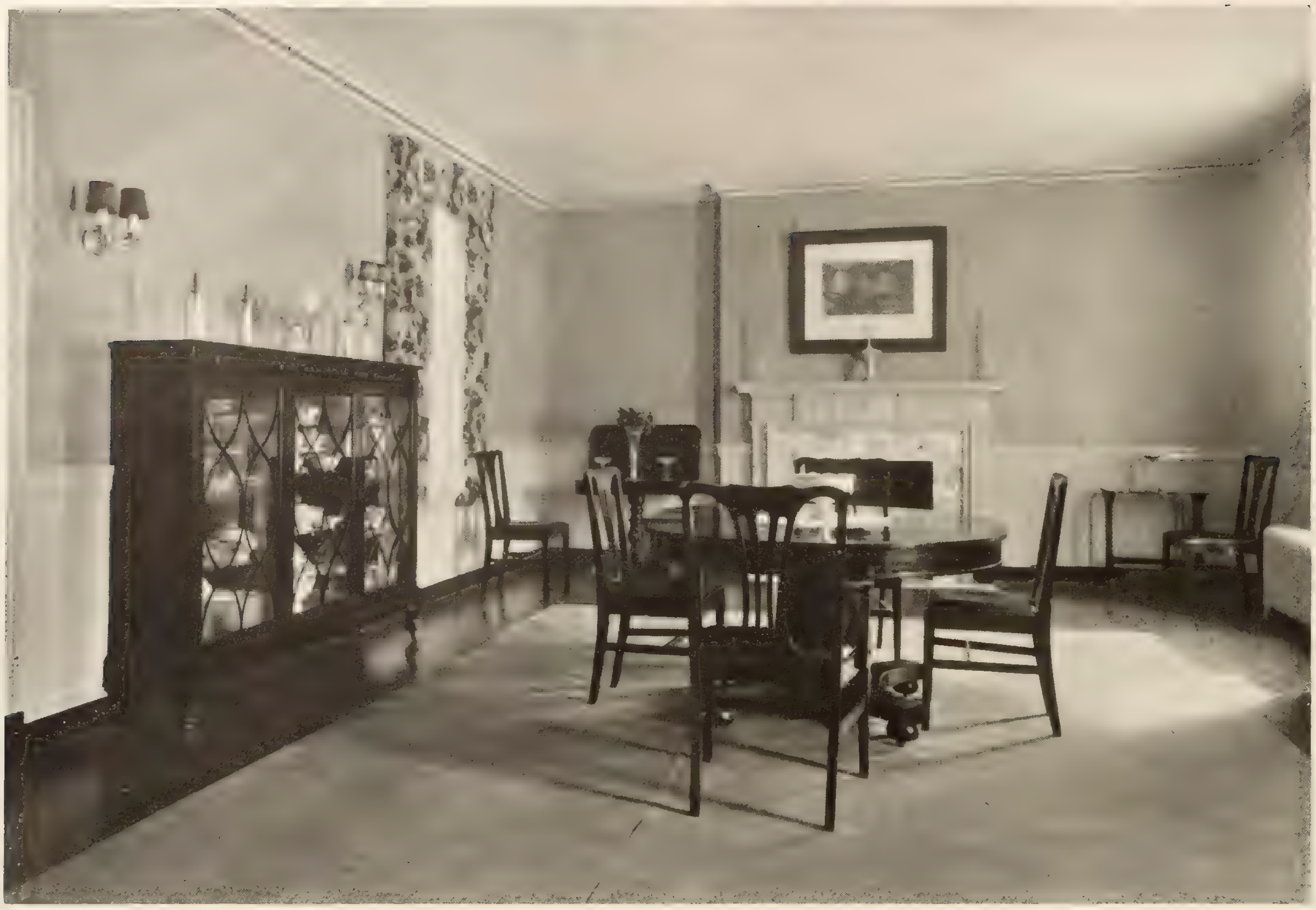
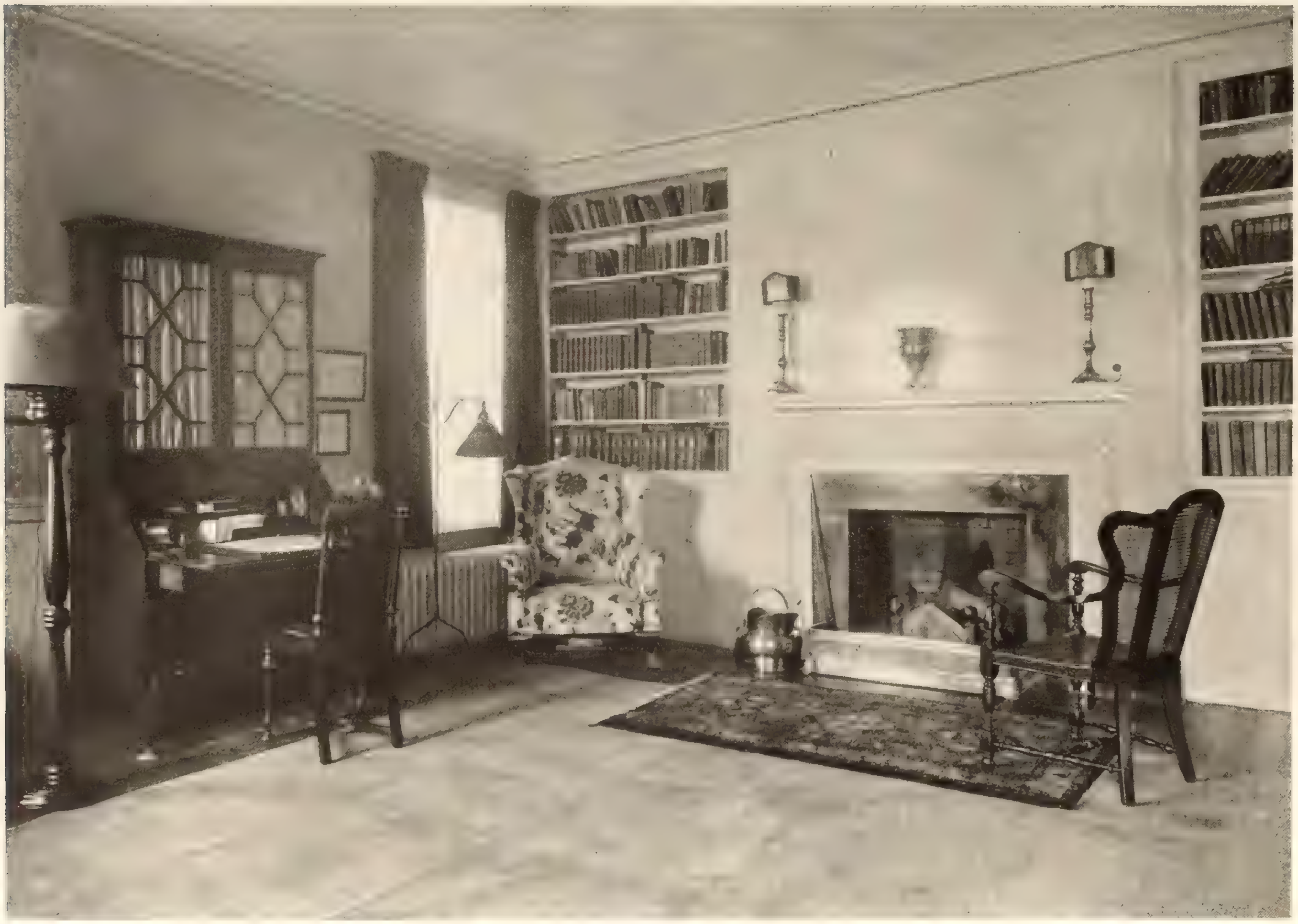




RESIDENCE, CARTER HALL, WASHINGTON, D. C. Waddy D. Wood, Architect.



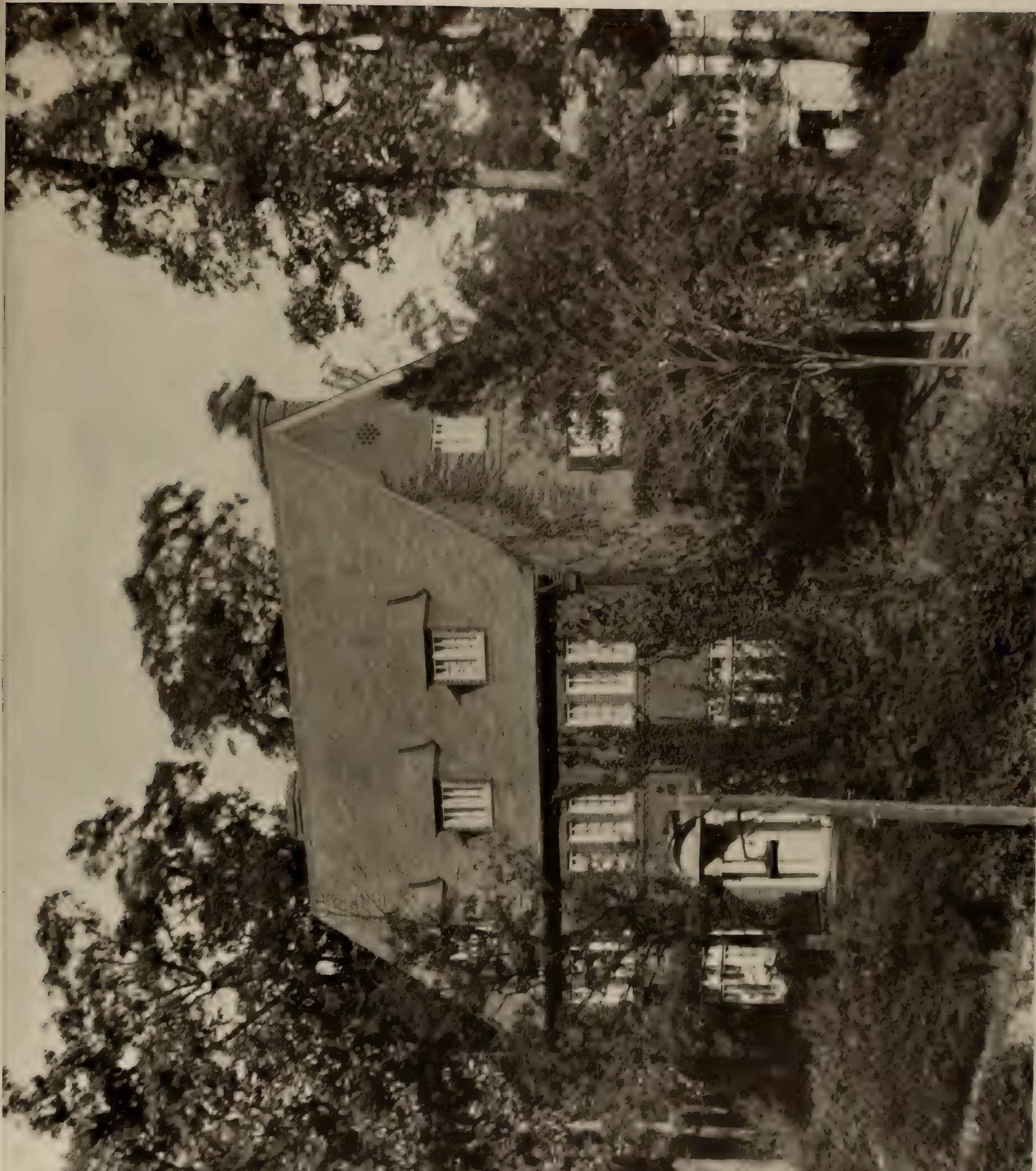
DINING ROOM.



LIBRARY.

Waddy D. Wood, Architect.

RESIDENCE, CARTER HALL, WASHINGTON, D. C.



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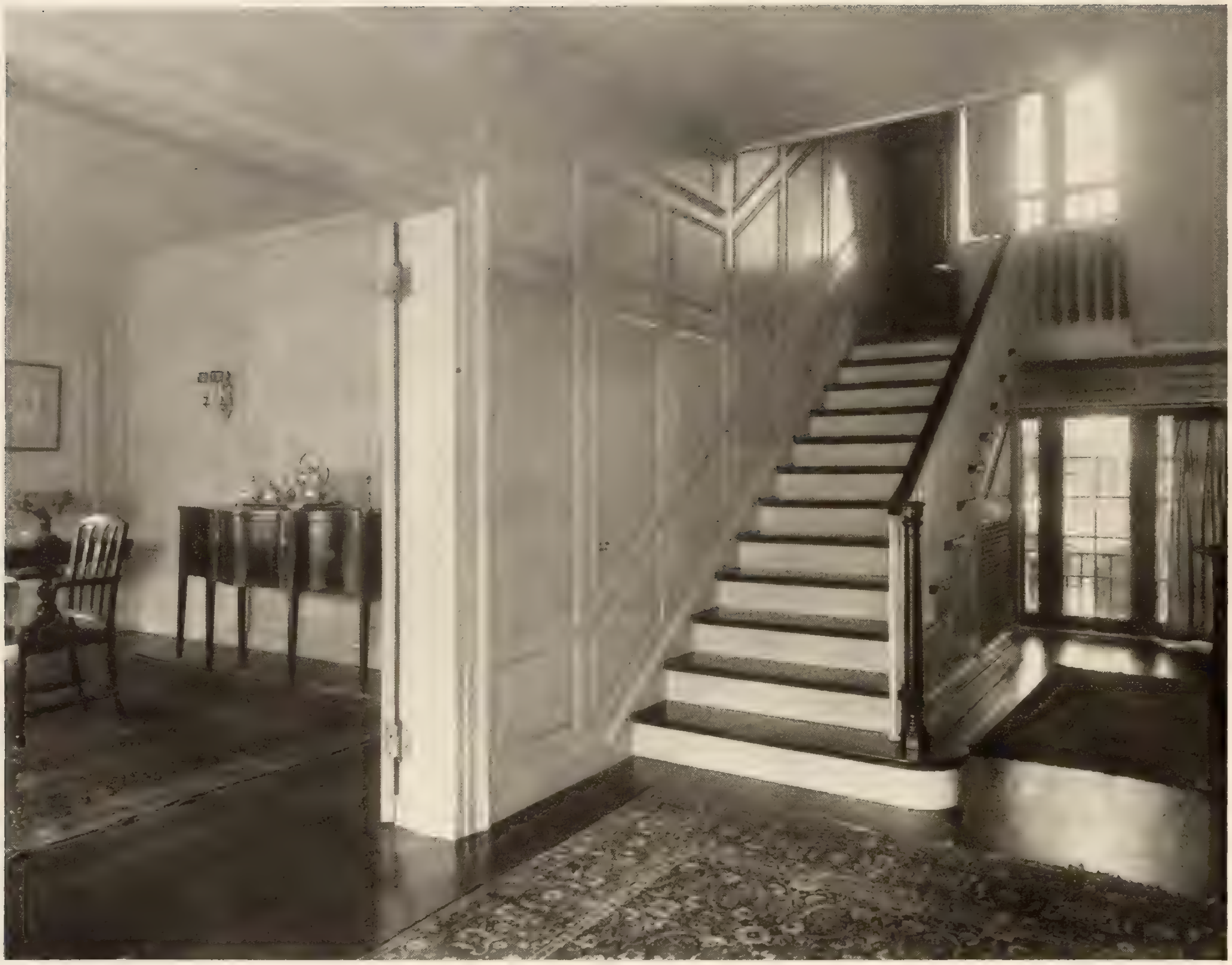
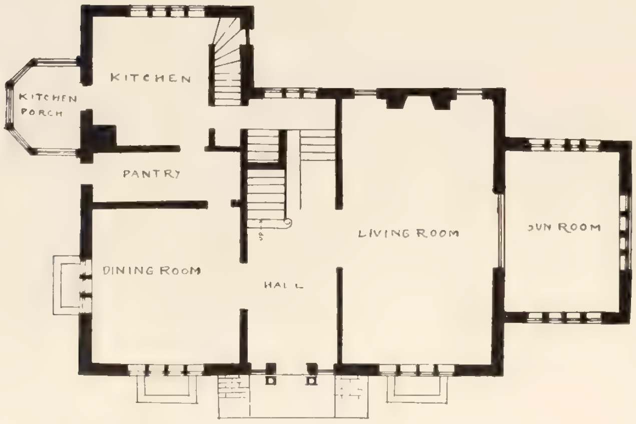
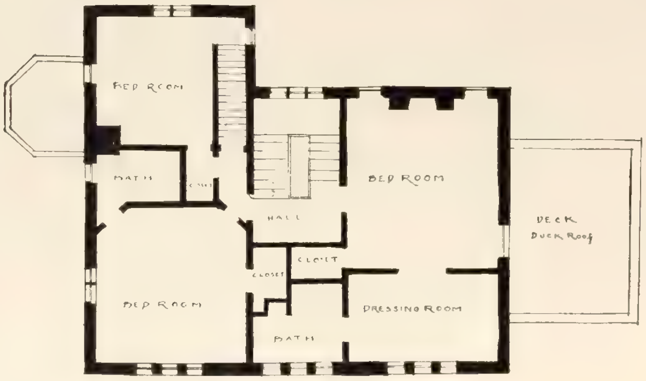
Laurence H. Fowler, Architect.



HALL AND STAIRWAY.

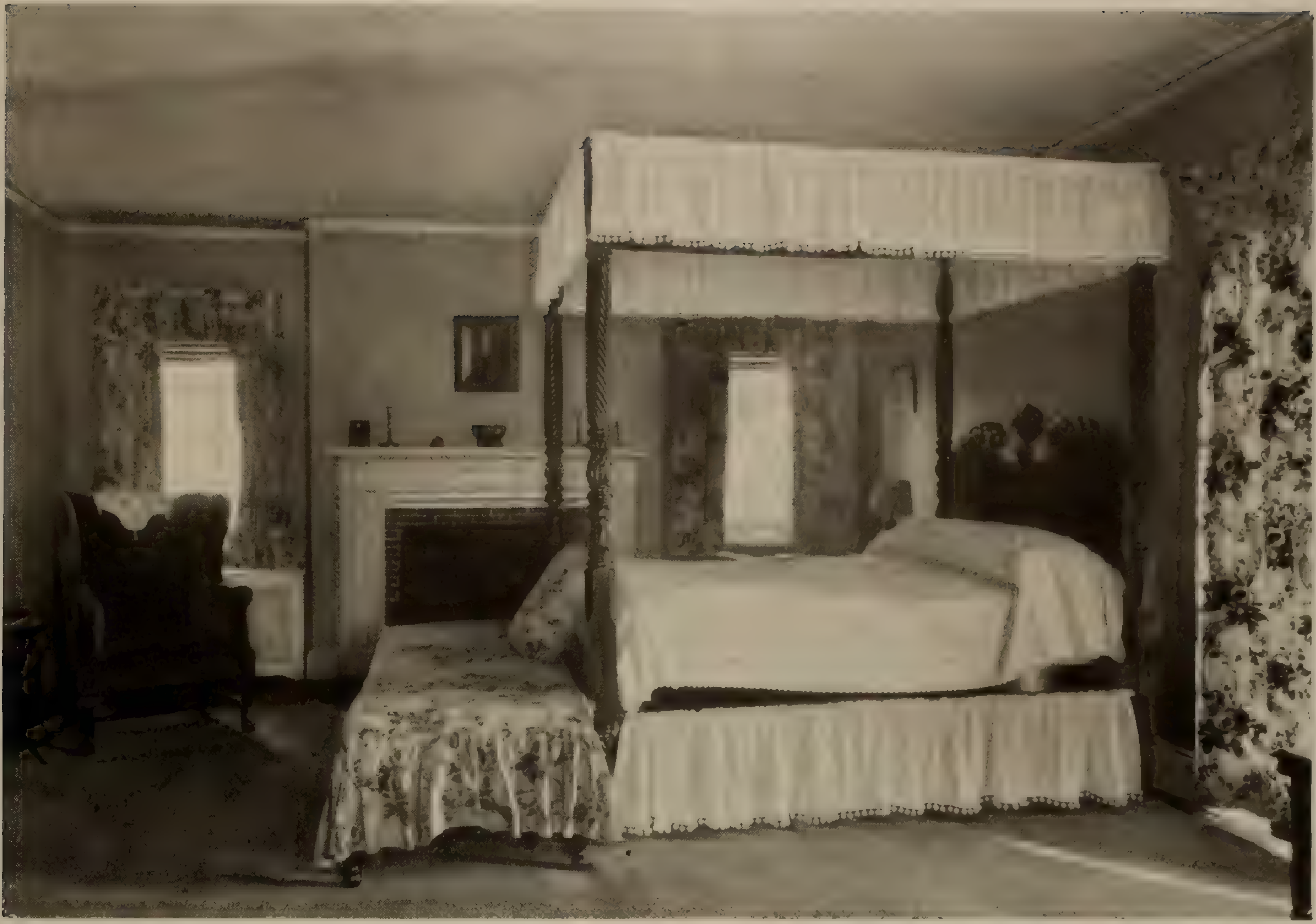


FIRST-FLOOR PLAN.

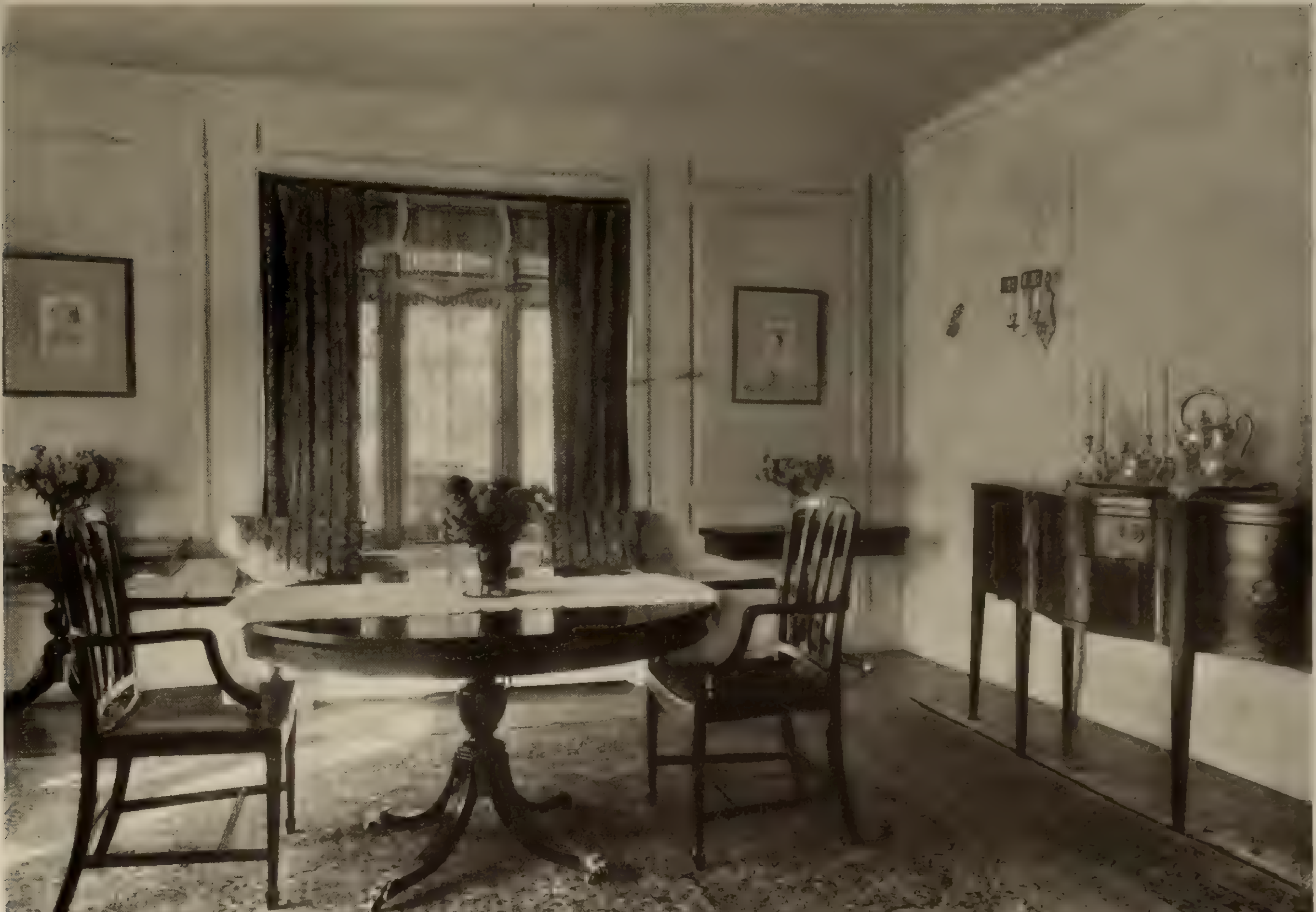


SECOND-FLOOR PLAN.

RESIDENCE, JAMES C. FENHAGEN, GUILFORD, BALTIMORE, MD. Laurence H. Fowler, Architect.



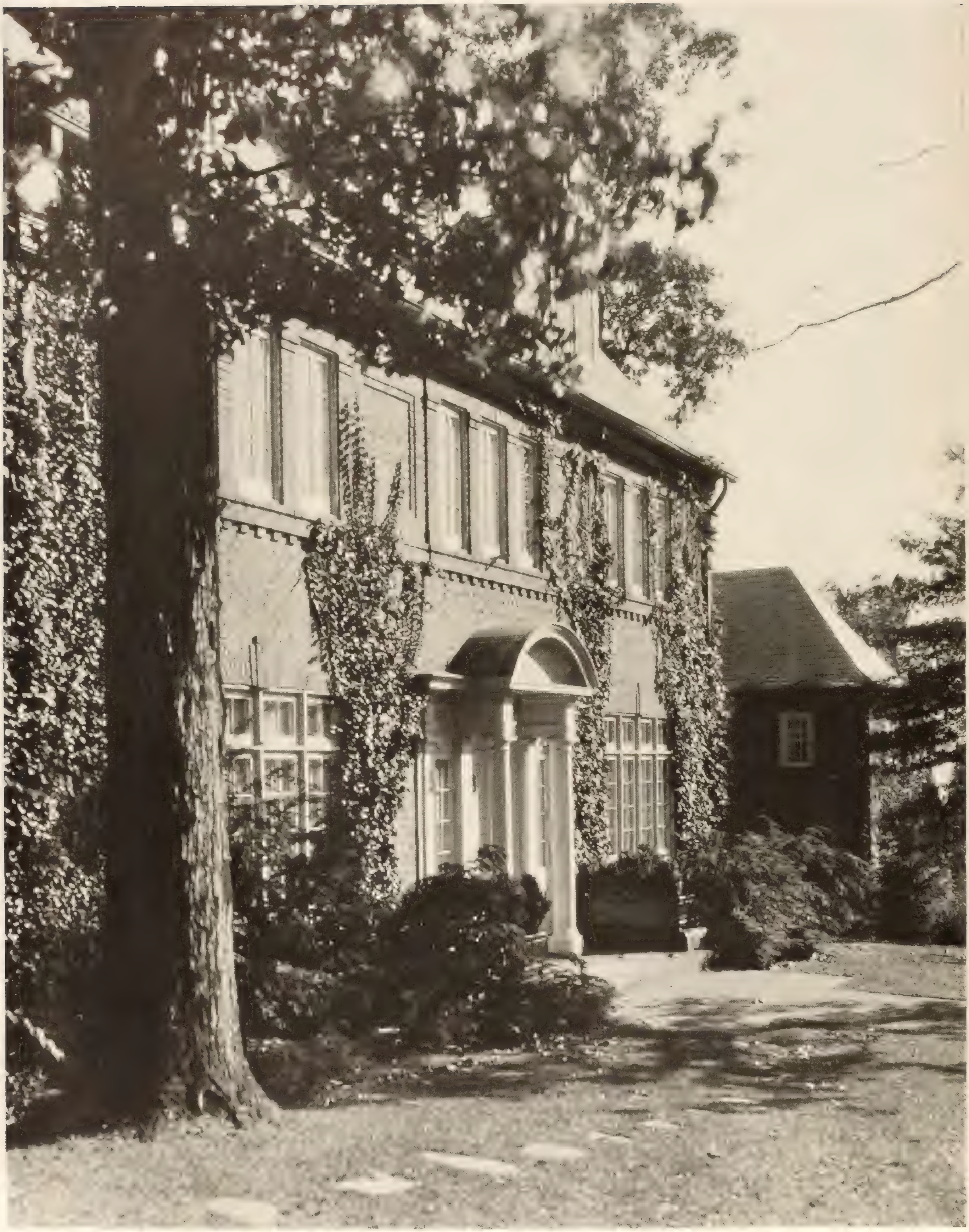
BEDROOM.



DINING-ROOM.

Laurence H. Fowler, Architect.

RESIDENCE, JAMES C. FENHAGEN, GUILFORD, BALTIMORE, MD.



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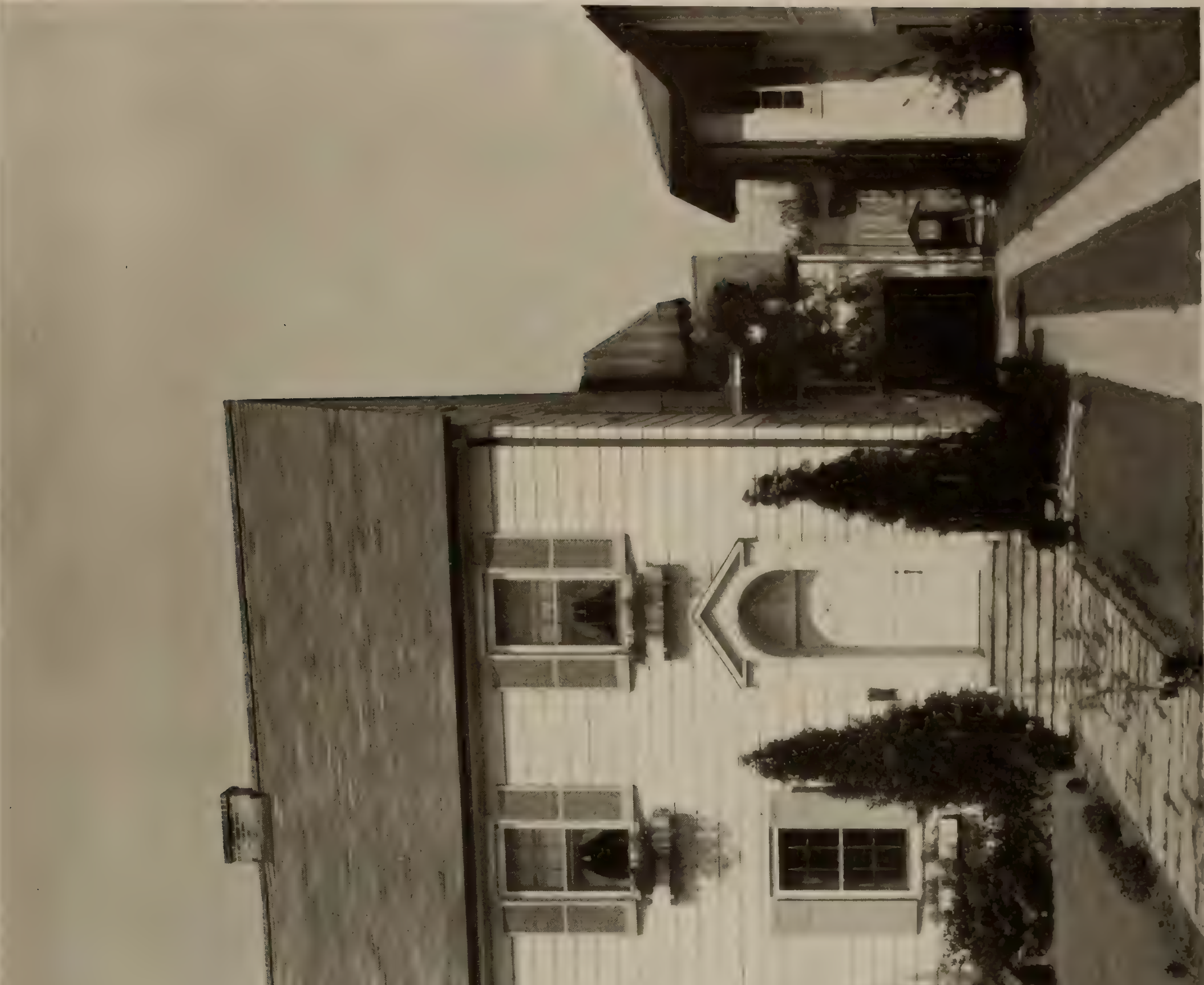
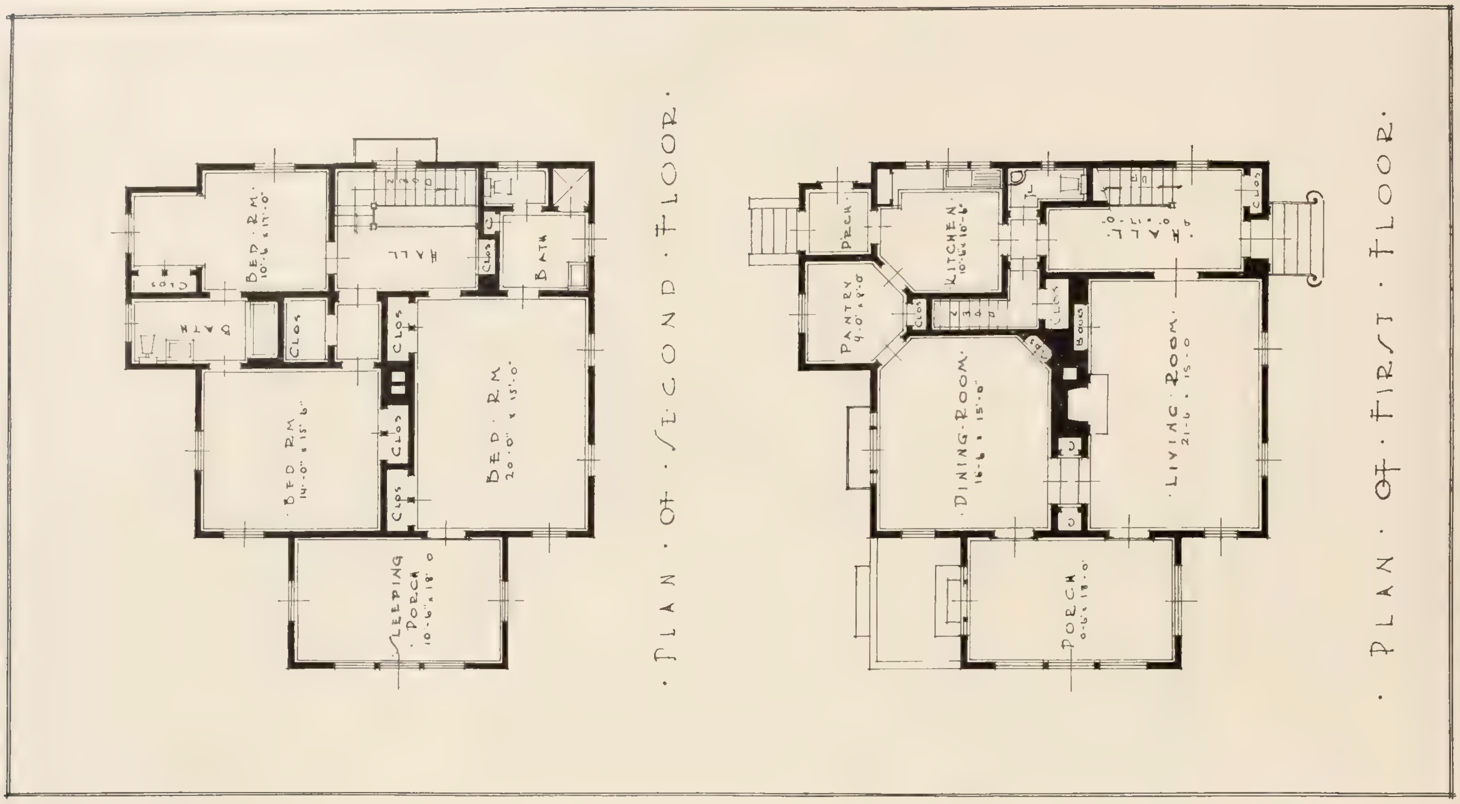
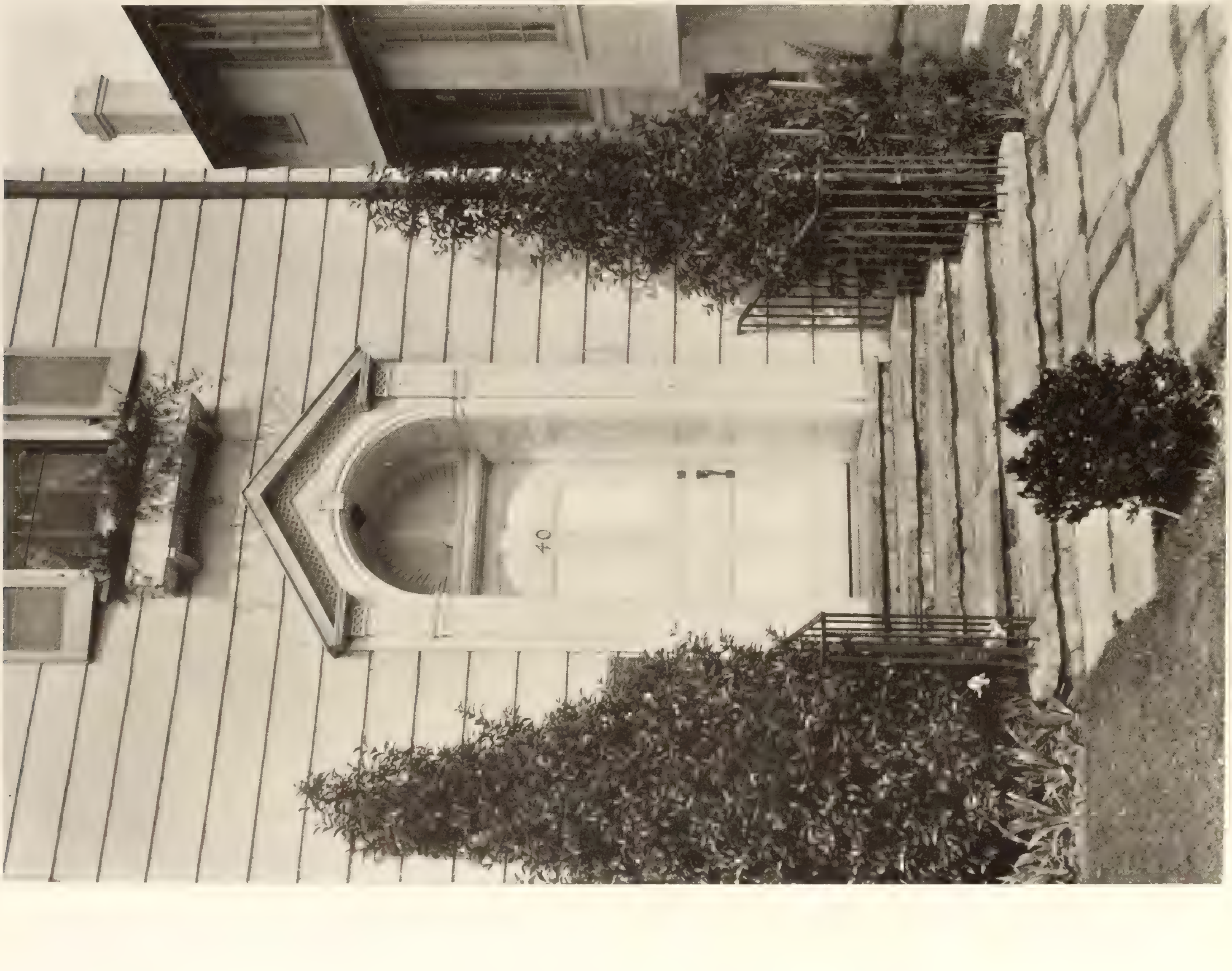


HOUSE, RICHARD FOSTER, NEW ORLEANS, LA.

Armstrong & Koch, Architects.


· PLAN · OF · SECOND · FLOOR ·
BED · RM · 10'·6 x 17'·0"
HALL
BATH
CLOS
BATH
BED · RM · 14'·0" x 15'·6"
BED · RM · 20'·0" x 15'·0"
SLEEPING · PORCH · 10'·6" x 18'·0
· PLAN · OF · FIRST · FLOOR ·
PRCH
PANTRY 9'·0" x 8'·0
KITCHEN 10'·6 x 10'·6
HALL
DINING · ROOM · 16'·6 x 15'·0
LIVING · ROOM · 21'·6 x 15'·0
BOOKS
PORCH 10'·6 x 18'·0

Armstrong & Koch, Architects.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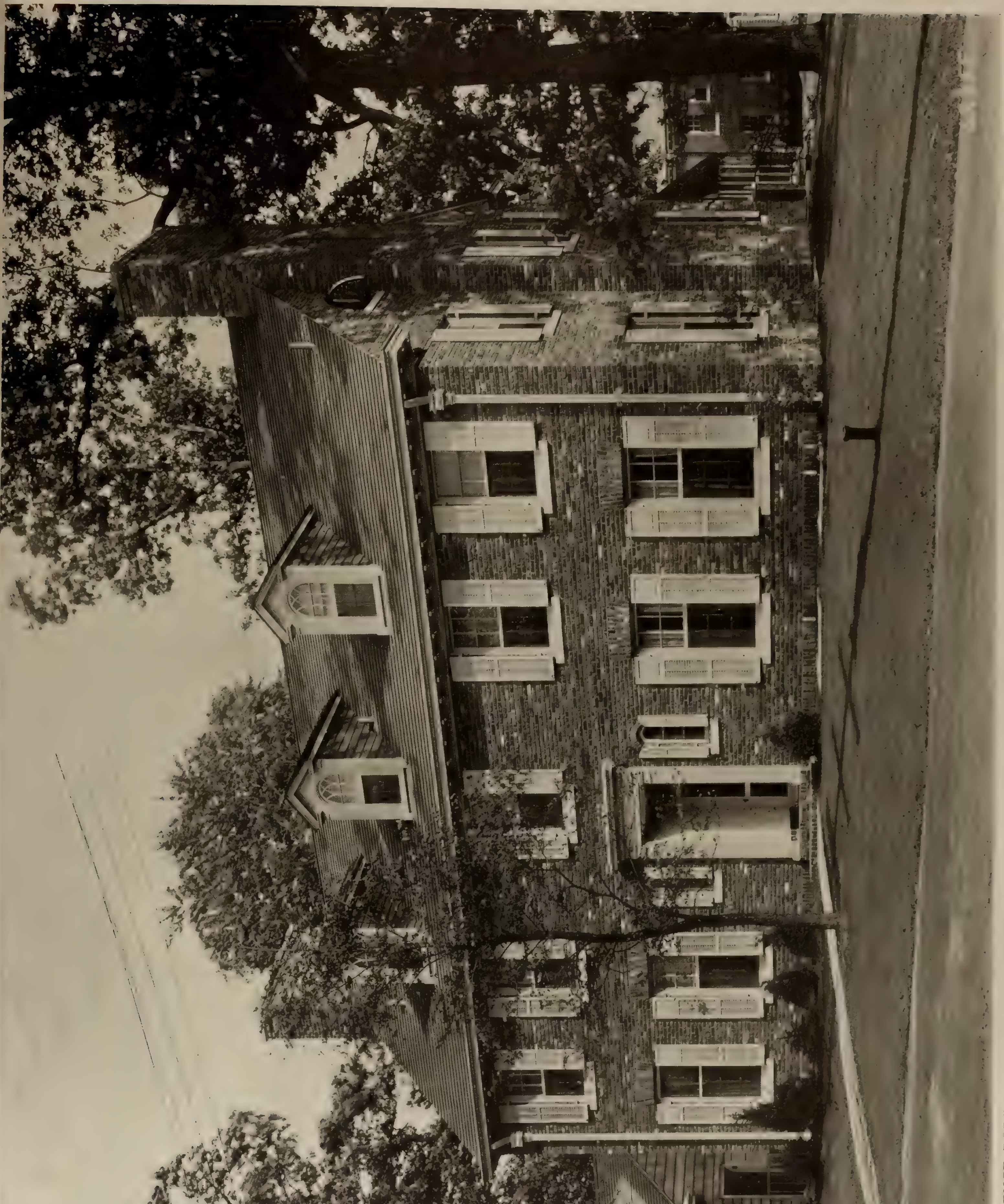
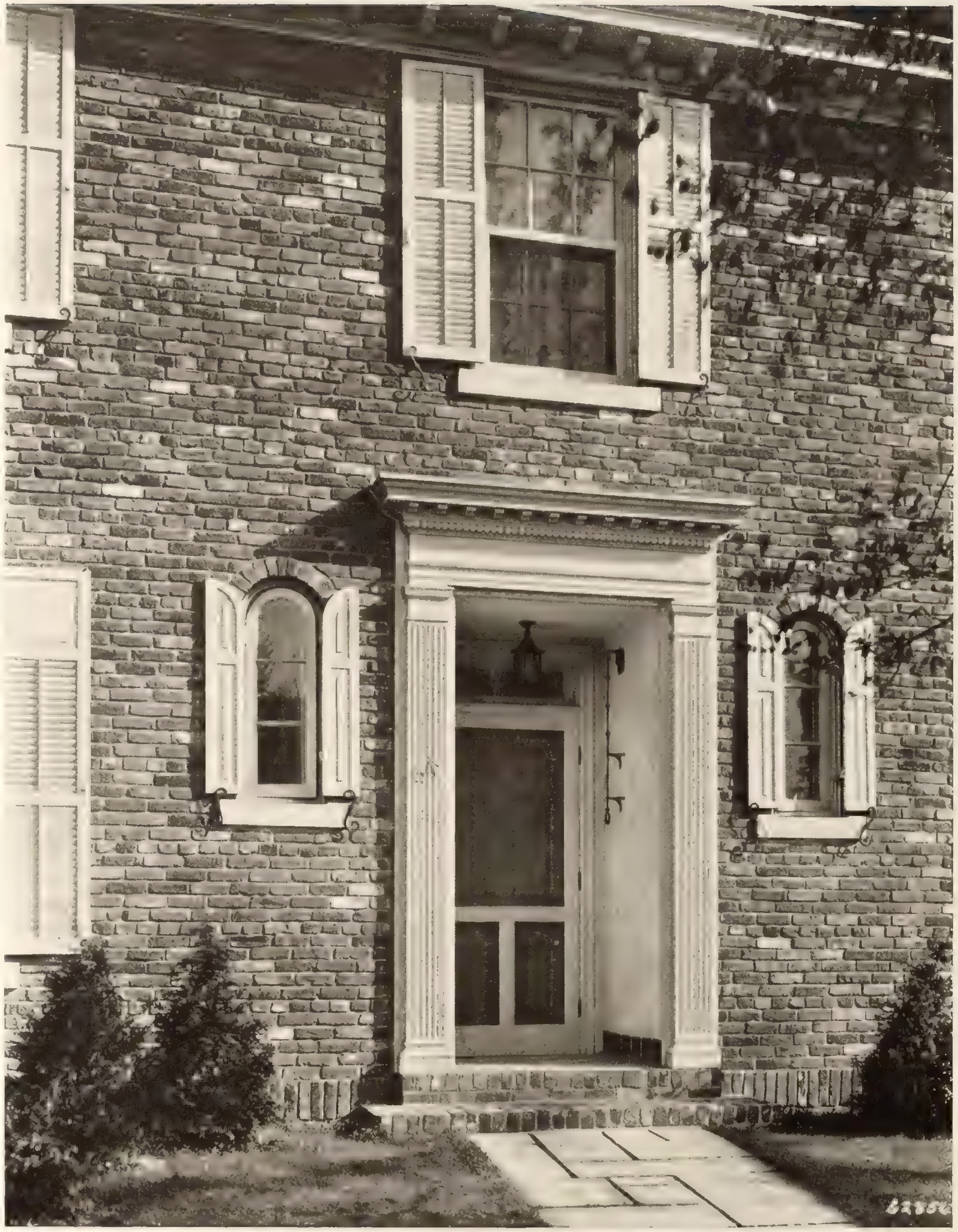


RESIDENCE, ROBERT O. DERRICK, DETROIT, MICH.

Robert O. Derrick, Inc., Architects.



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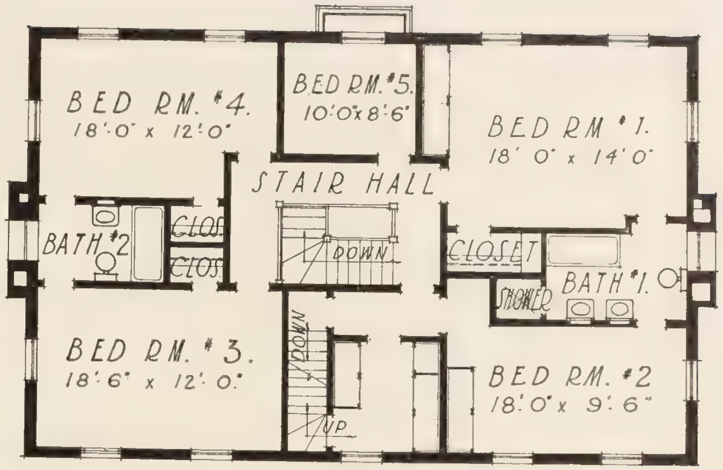
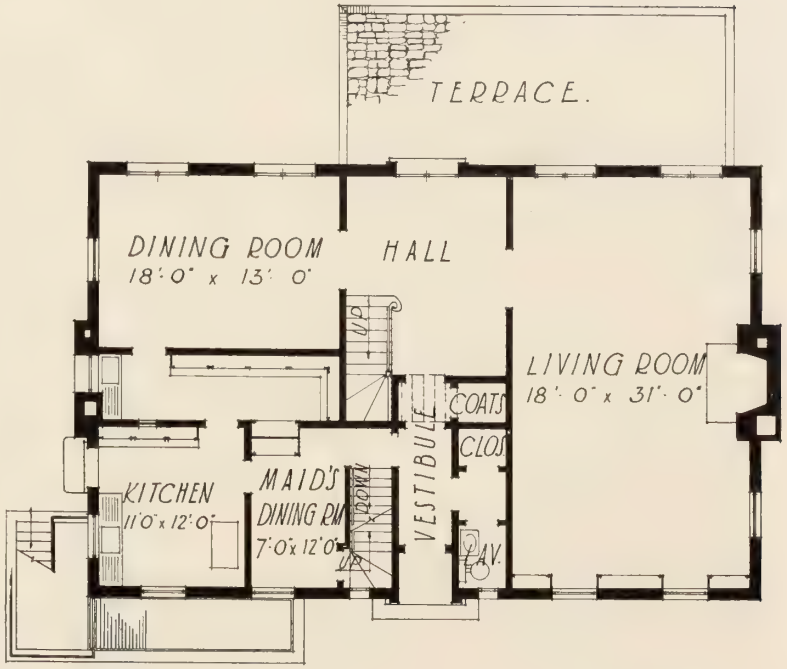
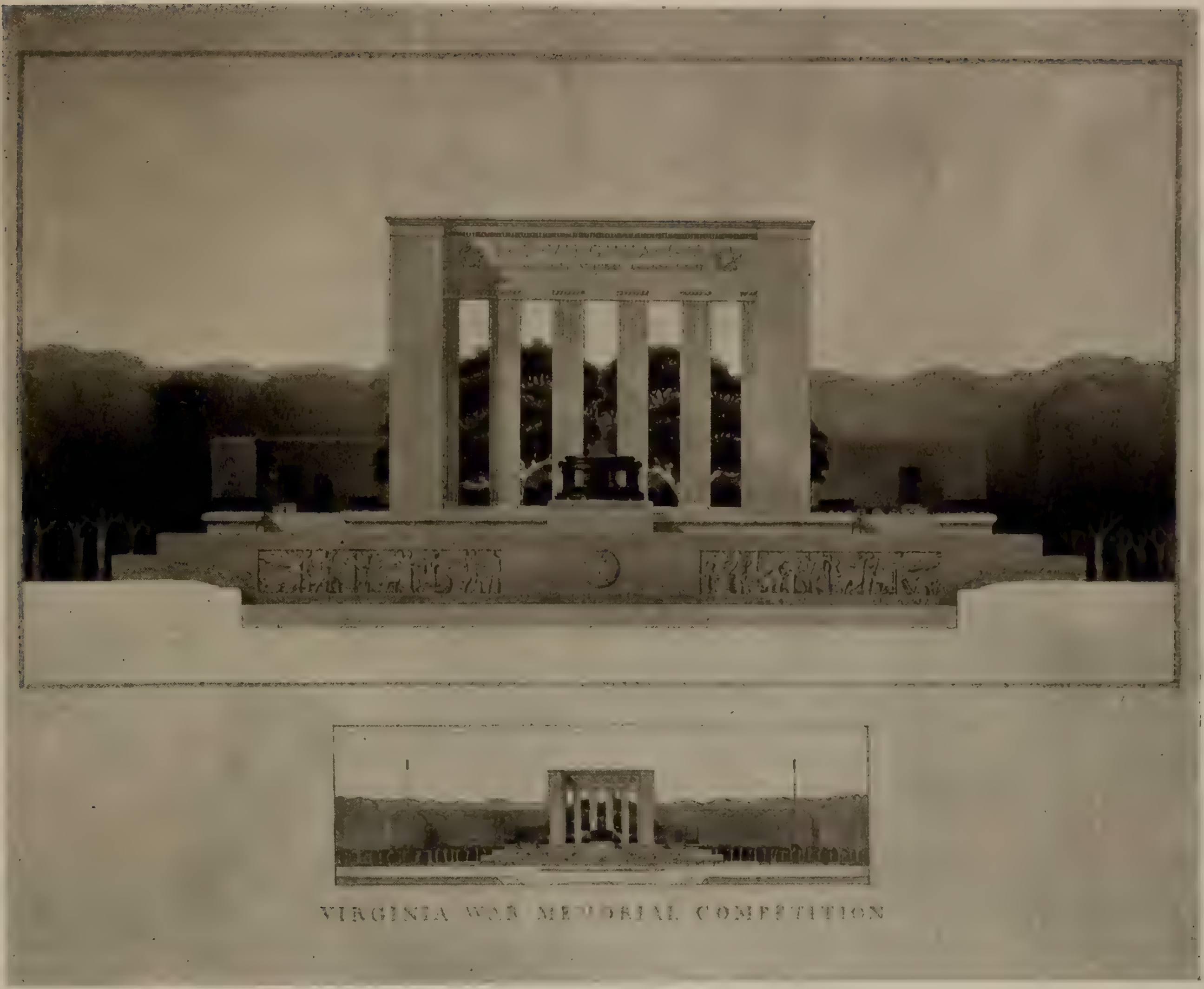


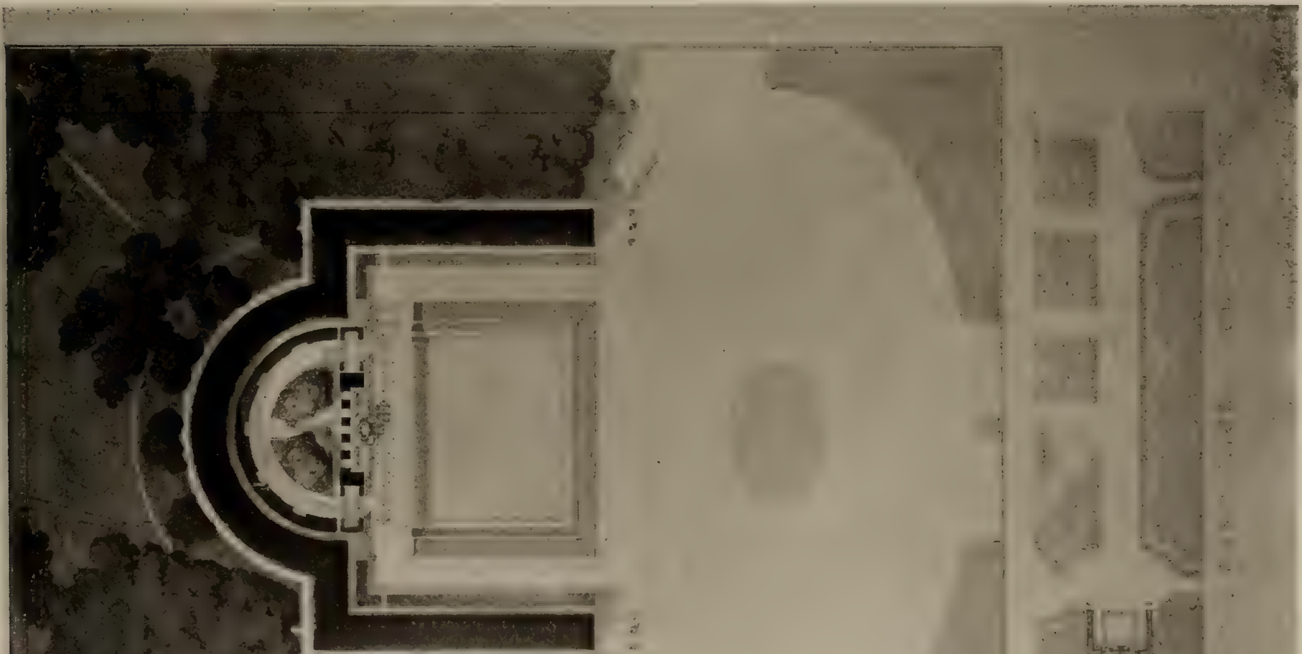
SECOND FLOOR PLAN



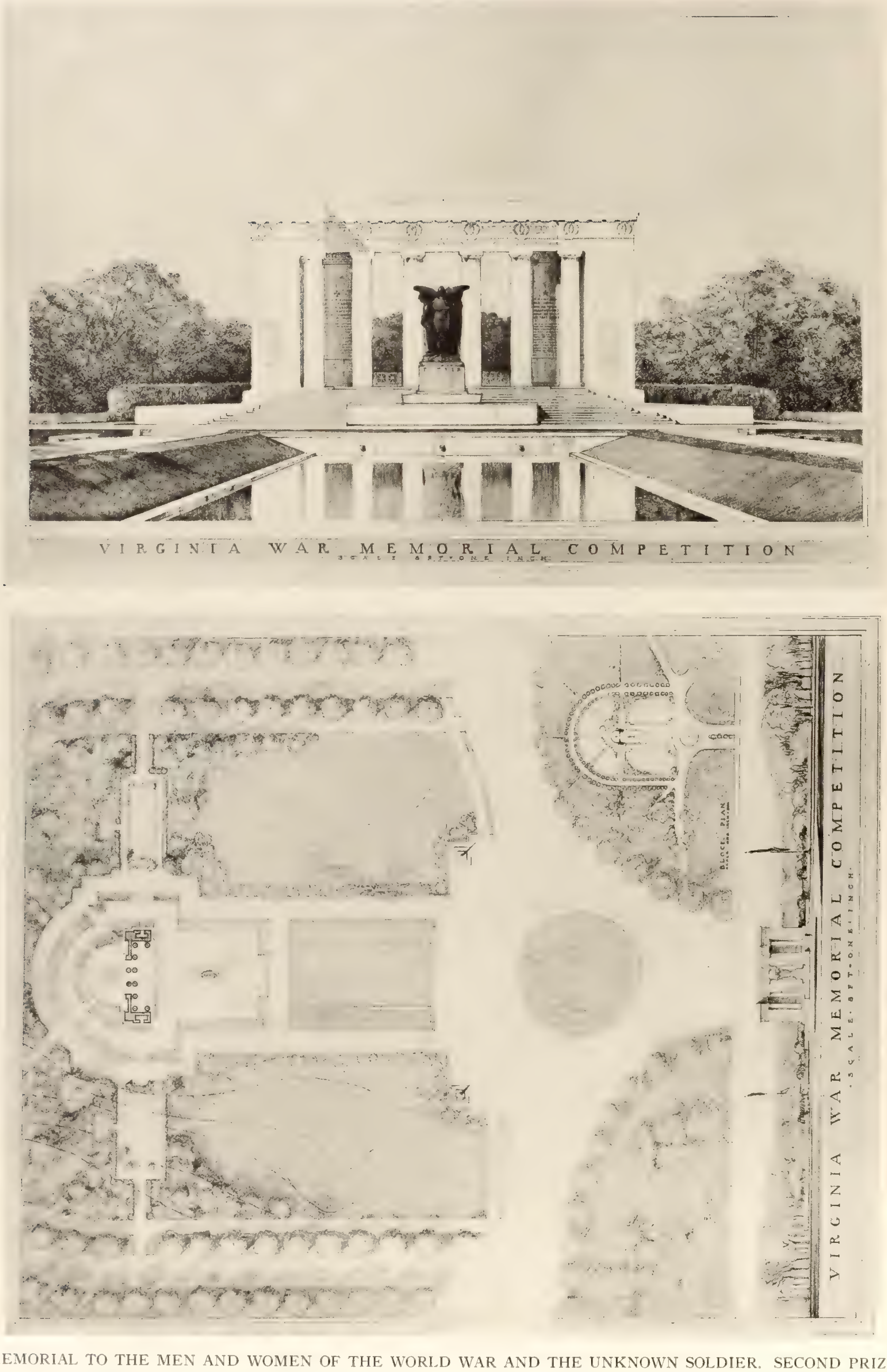
FIRST FLOOR PLAN

Robert O. Derrick, Inc., Architects.

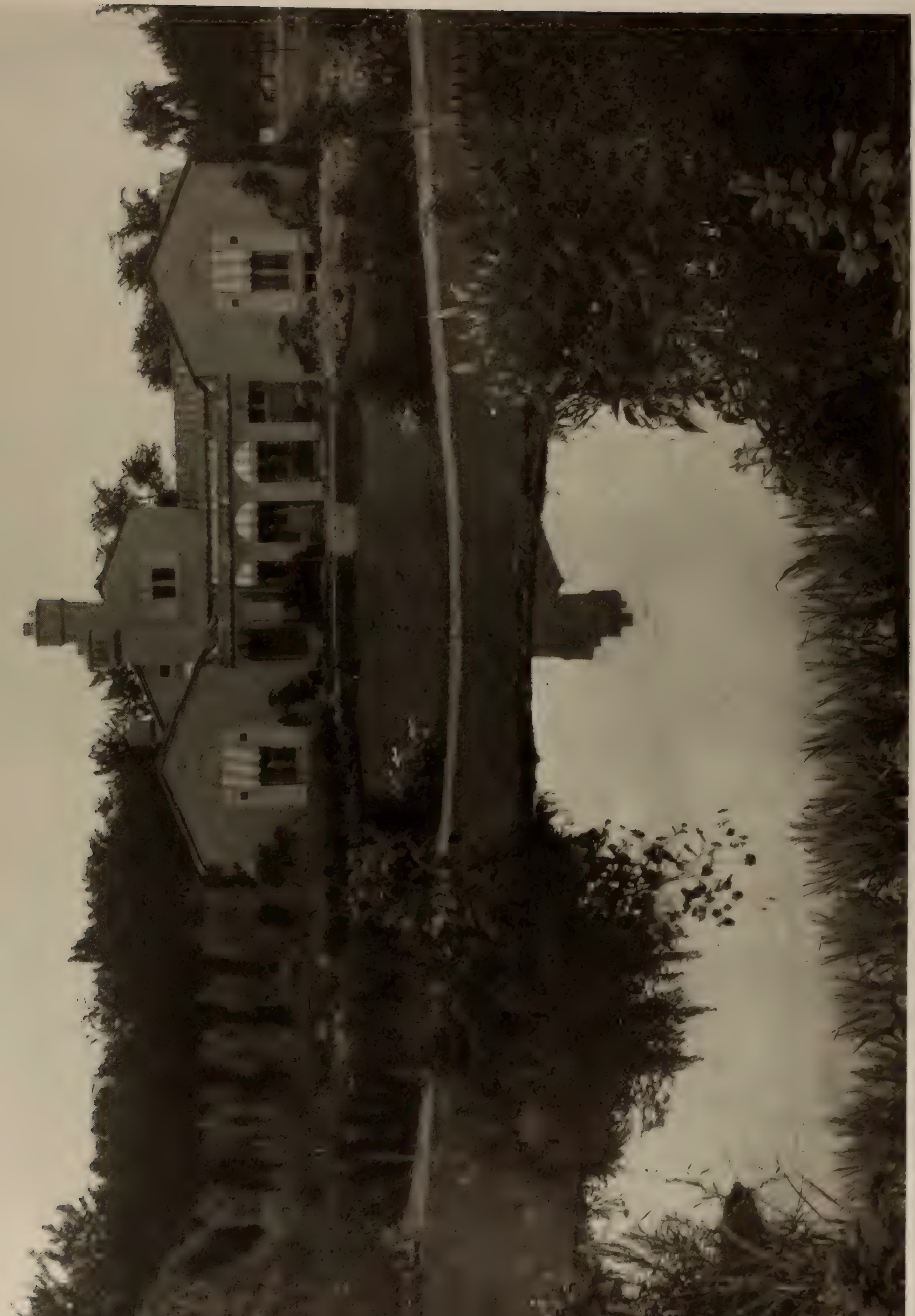




TO THE MEN AND WOMEN OF THE WORLD WAR AND THE UNKNOWN SOLDIER. WINNING DESIGN
Marcellus E. Wright, Architect; Paul P. Cret, Associate Architect; Berthold Nebel, Sculptor.

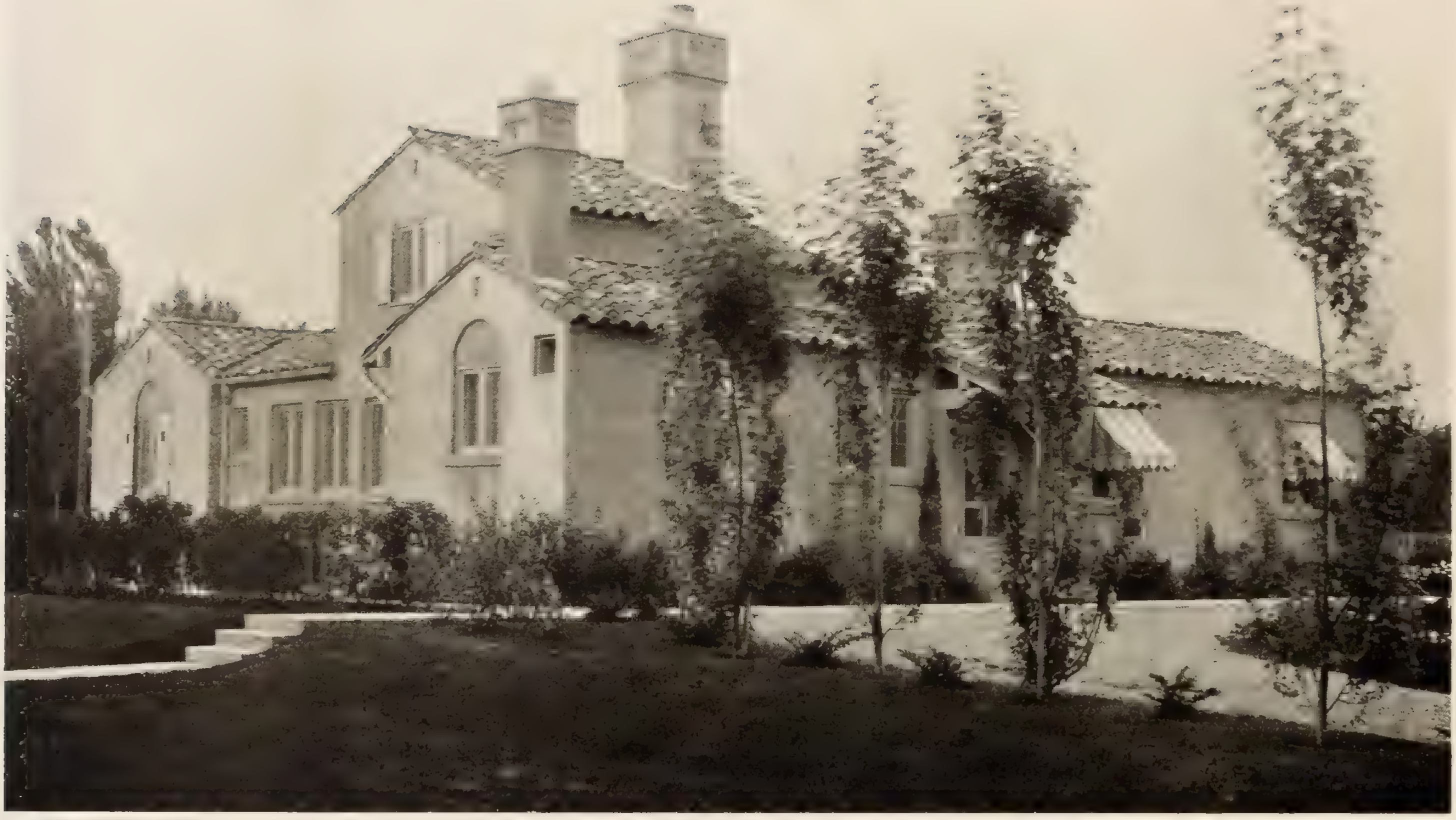

VIRGINIA WAR MEMORIAL COMPETITION
SCALE 8 FT. ONE INCH
BLOCK PLAN
VIRGINIA WAR MEMORIAL COMPETITION
SCALE 8 FT. ONE INCH

MEMORIAL TO THE MEN AND WOMEN OF THE WORLD WAR AND THE UNKNOWN SOLDIER. SECOND PRIZE.
Neff & Thompson, Architects; Armstrong & de Gelleke, Associate Architects; James Earl Fraser, Sculptor.

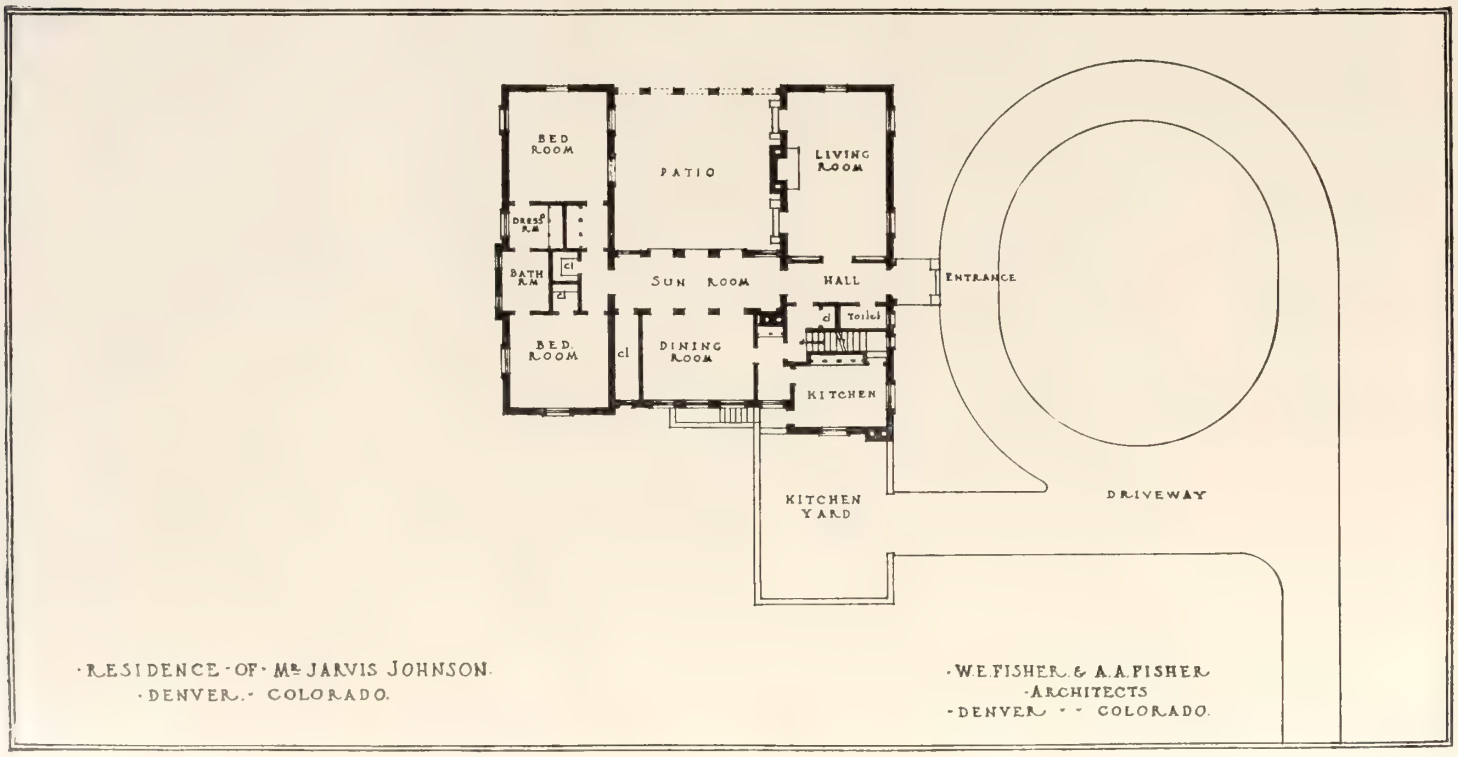


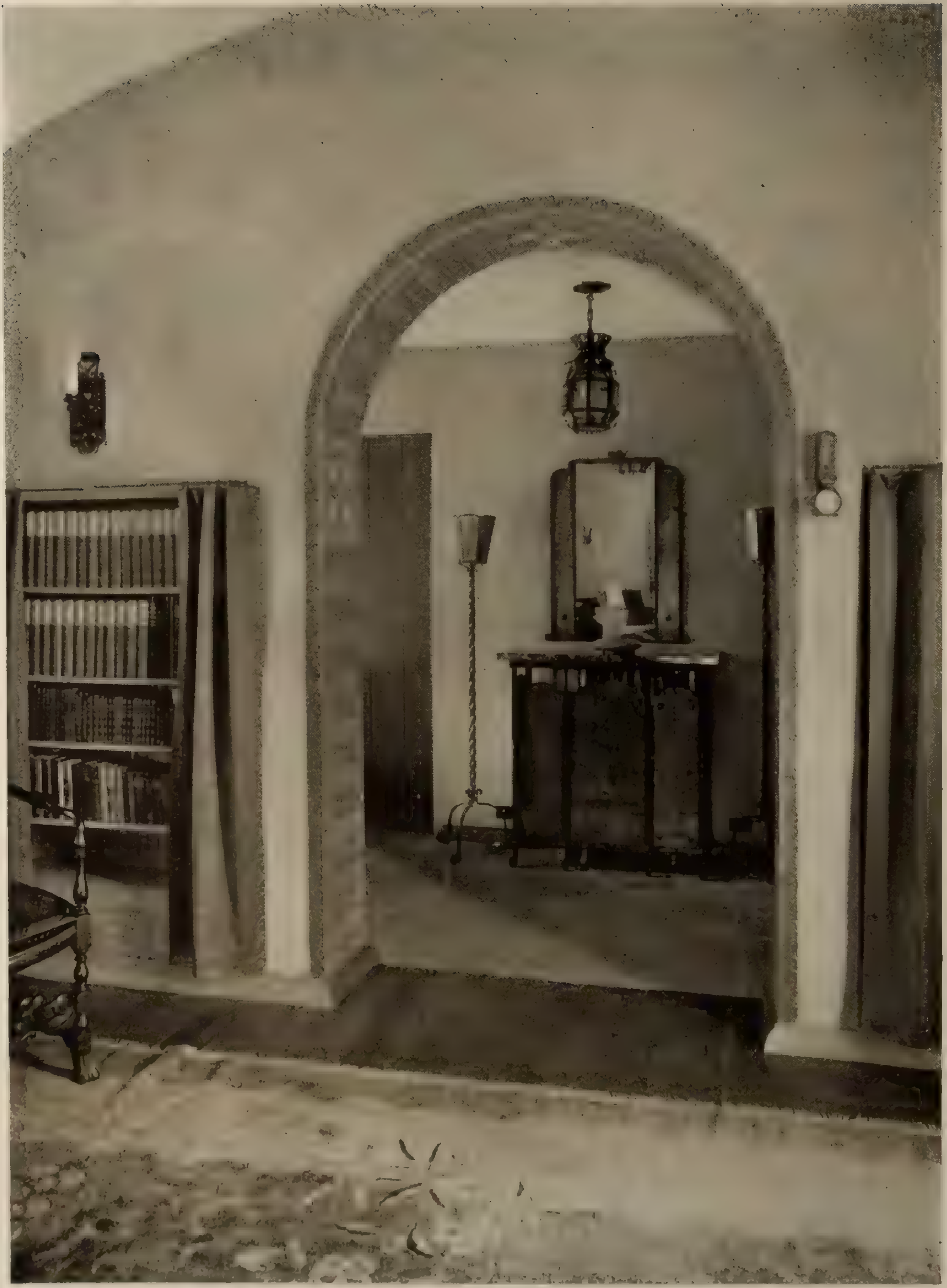
RESIDENCE, JARVIS JOHNSON, DENVER, COLO.

W. E. Fisher & A. A. Fisher, Architects.

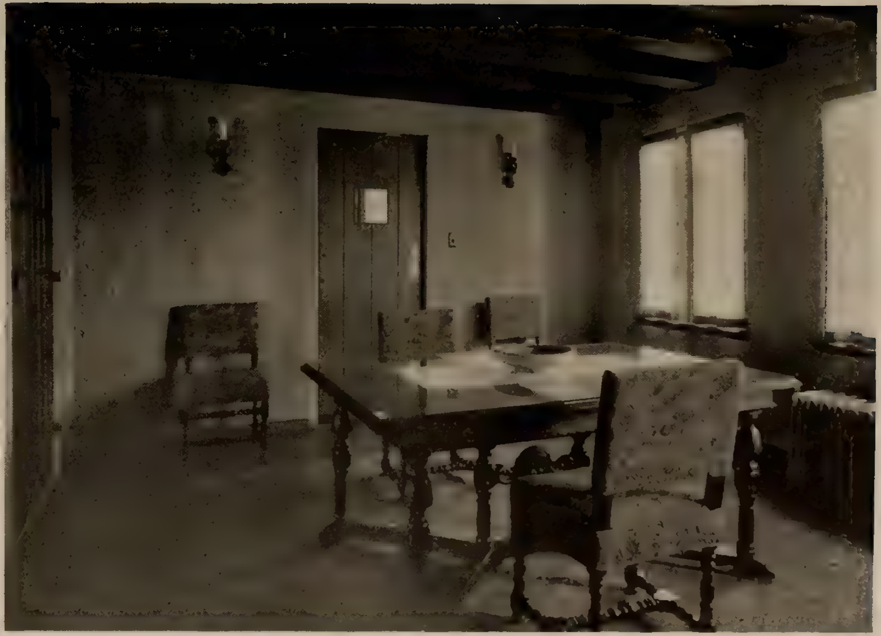


ENTRANCE FRONT.

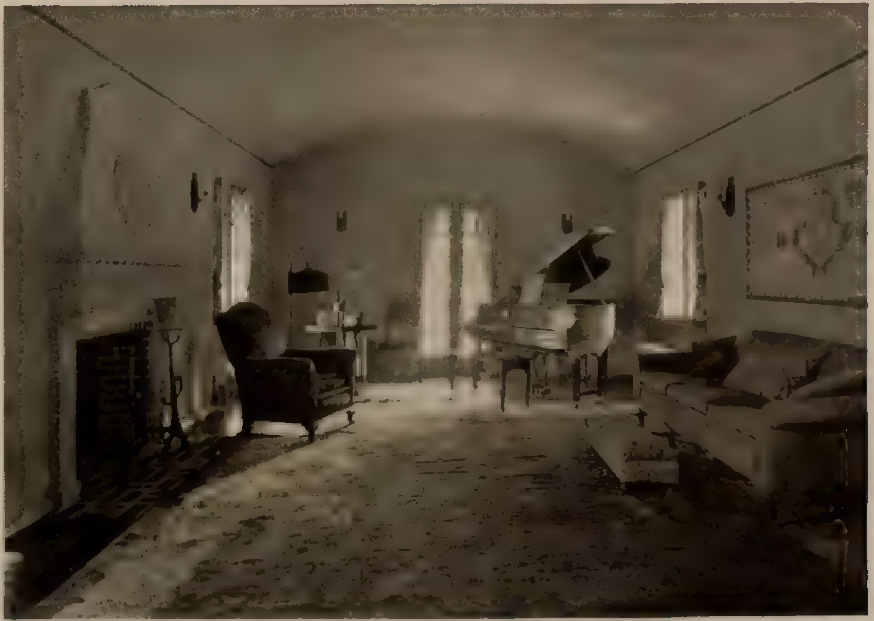




LIVING-ROOM, TOWARD HALL.



DINING-ROOM.



LIVING-ROOM.

W. E. Fisher & A. A. Fisher, Architects.

RESIDENCE, JARVIS JOHNSON, DENVER, COLO.

The Effect of Gravity on Building Construction

By H. Vandervoort Walsh

Professor of Construction, School of Architecture, Columbia University

Article IV

WHEN A FEW MEN BEGAN TO THINK ABOUT GRAVITY

LET us speculate a little on the days when there were no scales to measure the weight of things. Here is a father who wants to divide his wheat equally between his two sons. There are too many small grains to count in this manner—one here, one there. But there are two baskets, exactly the same size. To fill one and then the other would give an equal division. Now in lifting them, it was noticed that they seemed to be about the same weight, or resisted the physical action of lifting them in about the same way. This observation stimulated other thoughts. Stones of equal size seemed to be equally heavy (in the old meaning, equally difficult to heave). Then, two children of the same size seemed to be equally difficult to carry.

A man's heart in the balance scale weighed against the feather of truth.

Representation of Ka descending a tomb shaft to join the mummy.

Out of this thinking, somehow, a device was invented to measure the weight of things. It was found that if a stick was suspended on a string from the middle, and a certain size stone or piece of metal was hung at one end, and a similar one hung at the other, the stick would remain horizontal, equally indifferent to the weight at either end. However, the slightest addition of weight to one end would make the stick tilt down. From this crude balance scale grew the idea of measuring weight, by balancing fixed sizes of stones or metal with other objects. Standards of metal weights had to be established to do this. In Egypt it was the tema which served as the unit to measure things on this scale, and it is significant, that this is the same name given to the large measure of wheat. At least, it suggests that our previous speculations might have some basis of fact. The tema was divided into ten utens and these into ten kats. These names are not well known, but the weights used by the Babylonians are more familiar to us. It is from their systems that the shekel and the talent come. Thus all civilizations had to invent an arbitrary standard by which the force of gravity was made to measure itself.

The development and increased use of the balance scale helped to sharpen men's minds on this point of equality. It became the symbol of justice. From a machine for measuring grains and metals it took on a symbolic function. In Egyptian carvings, men's hearts are pictured as being placed in the balance scale by the jackal-headed God Anubis, and weighed against the feather of truth. Waiting to devour their hearts, if the scales tip down against the feather-weight of truth, is Amemit the eater of souls, crocodile, lion, and hippopotamus combined.

And so step by step the balance scale suggested more and more abstract ideas of weight and measurement. The more familiar we are with its use the more we take it for granted. Our conception of what a pound is grows to be a mental picture of a certain quantity of butter or sugar, and we almost forget that this measure of weight is purely a relative thing that had to be arbitrarily established. We speak of this man weighing about 150 pounds, and you get a fair picture in your mind of how big he is, but if we say he weighs 214 Roman libra you get no mental picture of the size of the man. This particular measure means nothing to you, because you do not feel it and are unable to bring up mental images of it. It has not established itself in your mind deep enough to permit you to use it in creating abstract conceptions of weight.

However, when you are told that the suit-case you will have to carry to the station weighs 50 pounds, that means something to you in terms of feeling. Likewise you can transfer that sense to a pull in any other direction than downward. If the kite at the end of the string pulls 50 pounds, you understand what that means, and yet that is not gravity, although you are measuring that pull with a unit which had to do with gravity. In this way we get to the notion that we can measure any push or pull with the same unit which we established for measuring the weight of things.

Now there was a certain Greek, Archimedes by name, best mathematician of antiquity, who must have been very amused with the balance scale, because he tried a number of experiments with it, and set down his observations. But, unlike his fellow men, he did not take this instrument for granted, for he was curious about it, and played with it, observing its antics.

Some of the things he noticed seem to be very obvious to us, but no one had ever set them down as rules. For example, he says, that equal weights placed at equal distances from the centre of the balance of the beam will cause the beam to remain in equilibrium or stay horizontal. Also, if to one of these weights is added some more weight, the beam will not remain balanced but tip down at the end where this additional weight is suspended. These very obvious things were noticed by all merchants who used the balance scale, but they never formulated them into laws of mechanics.

But he added to these observations others which were not so simple. He says that a heavy weight can be balanced by a light weight, if the light weight is moved out farther from the centre of balancing than the heavy weight. Perhaps this seems like common sense, but have you ever tried to prove it to yourself, or have you acccepted it because some one told you?

GREEK BALANCE SCALE AND MERCHANT

ROMAN BALANCE SCALE

If you have not, get a yard-stick and suspend it by a string at the middle. Now hang a couple of cubes of artgum erasers 9 inches out from the centre of the stick on the left-hand side. Then hang one cube of artgum on the right-hand side 9 inches out from the centre. What happens? The yard-stick revolves around the centre, counter-clockwise, the side having the two erasers dropping down and lifting the other up. It does not stop until the stick is practically parallel with the string.

Now slide the one cube out from the centre until it balances the two cubes. Where do you find the one cube, now? Out at the very end of the stick or twice as far out as the two cubes from the centre.

Here is the first lesson in mechanics, then. We have the yard-stick in equilibrium or balanced, when the two cubes on one side are 9 inches out from the centre and the one cube on the other side is 18 inches out from the centre. We can say this in another way. One cube is to the two cubes as 9 inches (the distance out from the centre of the two cubes) is to 18 inches (the distance out from the centre of the one cube).

Further experiments with various weights and distances which make for equilibrium of the scale-beam will always show that the light weight is to the heavy weight as the distance from the centre to the heavy one is to the distance from the centre to the light one.

Now this is as far as Archimedes went with his investigations, and the true significance of his observations was not realized until eighteen centuries later. To-day, nearly every schoolboy knows this to be the principle of the lever, and those who have played seesaw have been delighted in seeing the fat boy lifted from the ground because he is given the short side of the plank.

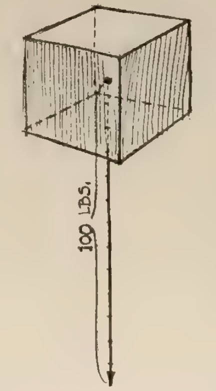
Intimately related to these laws of the balance scale is the idea of the centre of gravity. The middle point about which two equal weights balance on the beam is their centre of gravity. Each weight, too, has its own centre of gravity, and if it be suspended from it, it will balance so evenly about it that it can be rotated into any position about this point and remain there. The familiar and well-known illustration of this condition is the balancing of a circular disc of paper about its centre. This disc if held by a pin at its centre can be turned to any position and remain motionless. Likewise, if the diagonals of a rectangle are drawn and their point of intersection be pierced with a pin, the rectangle can be balanced in any position about the pin.

Archimedes understood the centre of gravity to be a point where the body could be supported and be turned in any position but always remain in equilibrium. He did not think of it as the position of the resultant pull of gravity on all the particles of which the body is made. This idea is a modern product of the imagination, well suited to visualize the action of the force of gravity. Indeed, it is a very convenient mental picture which is more useful than truthful. It is one that we have adopted to describe our force of gravity or any force, for that matter.

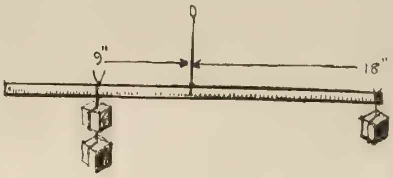
For example, here is a cube of stone, and it weighs 100 pounds. We mentally create a picture of a force of 100 pounds pulling down on that body by drawing a line from its centre of gravity down toward the centre of the earth. We usually put an arrow-head on the bottom of the line to show that the force works in this direction. If we draw the length of the line to some convenient scale, say $\frac{1}{8}$ of an inch for each pound, then we add to our mental picture a more complete description of the action of the force. For when we have shown the direction of a force, its path and its size, we have visualized enough facts about it to say that we know that force or have defined it. At least, we have seized upon enough of its characteristics to make a portrait of it, that is useful in considering its action in the building.

Now this picture of a force is quite modern, and none of the ancients understood it in the same way. Probably it will be modified in the future, when we understand better the nature of forces, but it serves its purpose quite well in our calculations. It is better than not having any impression at all, or believing as did our ancestors that the reason why a thing fell to the ground was because the air was too thin to hold it up.

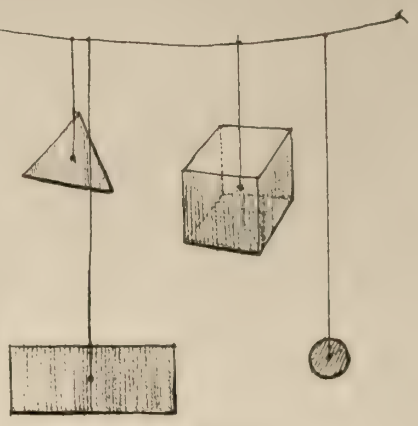
But such ideas were the results of the teachings of Aristotle, whose natural philosophy, along with the Bible, was the foundation of all knowledge in the Middle Ages. Men



DESCRIBING A FORCE GRAPHICALLY



· BALANCED ·



CENTERS OF GRAVITY

believed that bodies were classified as absolute heavy bodies and absolute light bodies and that they sought their places, the light bodies belonging on top and the heavy bodies down. Motions were classified as natural or violent. Large bodies were believed to fall quicker than small ones and their velocity of fallings was supposed to be proportional to their weights.

It will be recalled that the independent thinker, Galileo, attacked this theory and to prove that it was wrong dropped different size weights from the leaning tower of Pisa, and although the little weights reached the ground as soon as the heavy weights, the schoolmen of his day would not relinquish their beliefs, but created such an uproar that he had to leave Pisa for Padua.

It is to this thinker that we owe the first clear description of a force as a mechanical agent. But he summed up certain ideas that had been growing in other men's minds, and these we must consider, too, in their relation to the development of the knowledge of building mechanics.

Book Reviews

A HISTORY OF ARCHITECTURE IN LONDON ARRANGED TO ILLUSTRATE THE COURSE OF ARCHITECTURE IN ENGLAND UNTIL 1800, WITH A SKETCH OF THE PRECEDING EUROPEAN STYLES. By Walter H. Godfrey, Architect. With a Preface by Philip Norman, LL.D., F. S. A. With 250 illustrations, 7 maps and descriptive guide to buildings. Charles Scribner's Sons, New York.

This is an excellent guide-book for the architectural student. The chapters deal with English Romanesque (Norman), Gothic, Tudor, Renaissance, Georgian, and the many illustrations show notable examples of the various periods.

The series of maps, on which the location of important buildings may be traced, should prove very helpful, and save a lot of time.

We recommend it to the student and to the architect who may be on his way to, or possibly only thinking over, the London he last visited. Of course, the book is all given over to old London; the modern city is not considered.

PROBLEMS IN ARCHITECTURAL DRAWING. By Bush & Townsley. The Bruce Publishing Company, Milwaukee, Wis.

"Problems in Architectural Drawing" is a beginner's course based on a modern house of colonial design. The book is divided into two sections: Series A presents each problem in pictorial form, either isometric or perspective; Series B presents the working drawings in orthographic projection. Simple statements on house planning, house construction, with eight typical American homes preceding practical work of drafting.

The instructions for executing plates are clear and complete. Plates are 7 x 10 inches, allowing for detailed study. Ample instructions are given for walls, stairs, details, etc. The plates are progressive in difficulty, and so developed to "force the pupil to think." The book is of invaluable aid to the student, tradesman, mechanic, etc.

RELATION IN ART: Being a Suggested Scheme of Art Criticism, with Which Is Incorporated a Sketch of a Hypothetic Philosophy of Relation. By Vernon Blake. 8vo, illustrated. Oxford University Press, American Branch, New York.

"After mature deliberation I have decided to begin by putting forward the purely abstract philosophical considerations first." This the author has done in a series of chapters that will call for close attention and a mind that likes to engage in subtleties and theories out of the common. The chief aim of the book, according to the preface, is "to look on the means of plastic expression as a language fitted to express forms of thought. These means are examined and analyzed on one side; on the other, the form of thought of different epochs and of different peoples and different artists is discussed and co-ordinated with technical expression."

If the first part of the book seems difficult to follow, the reader may begin with Part II and take up with the author his various opinions and comments upon Architecture, Sculpture, Drawing, Form in Drawing, Drawing in Painting, Composition, Light and Shade, Color, Technic, Recent Art. It is a book to provoke thought and concentrate attention.

A SHORT HISTORY OF THE BUILDING CRAFTS. By Martin S. Briggs, F. R. I. B. A. Illustrated, 12mo. Oxford University Prses, American Branch, New York.

This book is intended to link ancient architecture with modern building construction, and to show architect and craftsman alike how building work was done long ago, the various "trades" or crafts of brickwork, masonry, concrete work, carpentry, joinery, ironwork, slating and tiling, plastering, plumbing, and glazing, are historically treated in successive chapters. At the beginning is a brief general sketch of the position of architects and craftsmen in the past. More than 250 sketches by the author illustrate the text.

THE TOUCHSTONE OF ARCHITECTURE. By Sir Reginald Blomfield, R. A. A., etc. Oxford University Press. American Branch, New York.

The various essays in this small book—"State-Aided Training in Art in England," "The Artist and the Community," "Famous Men," "The Outlook of Architecture, 1913," "Atavism in Art," "The Bridges of London (1815–1920)," "The Tangled Skein," "Art in England, 1800–1920," "Greek Architecture," "Christopher Wren," "Architecture and Decoration," "Off the Track," "Some Thoughts on Art"—are addresses delivered on various public occasions. They are rich in experience and have a personal and individual note that stimulates thought. The author's attitude is that of one trained in the old school of hard work. He sees with clear vision the anarchy in art that follows the preaching of short-cuts, the tendency to break up tradition, to try to sail the difficult region of art without a trustworthy and tested compass.

It is a plea for sanity in the teaching and practice of all the arts. Art is in a bad way in England, and the pace of life there, "the motor standard," is unfavorable to the practice of the arts.

Contrary to many of our English observers, the author does not look upon our skyscrapers with approval, but we think that his comment, "the solutions have not been happy because the essential elements of tower design have been forgotten," would be modified if he could see the results in New York since the zoning laws have come into being.

SMALL COUNTRY-HOUSES OF TO-DAY. Volume Three. By R. Randall Phillips, Hon. A. R. I. B. A. Charles Scribner's Sons, New York.

No doubt many of our readers are familiar with the earlier books by the author. He presents an interesting survey of English domestic architecture of to-day, and affords an opportunity to make comparisons with work in this country. There is no denying the charm, the essential element of domesticity in a number of these houses, and no one could possibly mistake any of them for anything but English. They are reminiscent of the English countryside of many generations. The excellent and abundant illustrations give elevations, interiors, plans, and often the landscape setting. The accompanying text gives details, regarding materials and any special features of construction.

ELEMENTARY PRINCIPLES OF SURVEYING. A Text-Book for the Use of Students, Engineers, etc. By M. T. M. Ormsby. Second revised edition. With One Hundred and Forty-two Diagrams and Illustrations. Including Five Folding Plates. D. VanNostrand & Co., New York.

This is a standard work of value, and offers the student an elementary course in surveying, and makes an admirable text-book for both student and teacher.

LIGHT, PHOTOMETRY AND ILLUMINATING ENGINEERING, EMBODYING A THOROUGH REVISION OF LIGHT, PHOTOMETRY AND ILLUMINATION. By William E. Barrows, Professor of Electrical Engineering, University of Maine. McGraw-Hill Book Co., 379 Seventh Avenue, New York.

This is a text on illuminating engineering and a reference work for the practising engineer, growing out of the author's previous books, "Electrical Illuminating Engineering," and "Light, Photometry and Illumination." About two-thirds of the present book is entirely new. The book presents the accepted principles and practice of modern artificial illumination and the choice of lighting equipment. Various types of lighting installations are thoroughly discussed.

The new Fifth Revised and Enlarged Edition of PRACTICAL STEAM, HOT WATER HEATING AND VENTILATION, by Alfred G. King. The Norman W. Henley Pub. Co. 2 West 45th Street, New York.

This is the most complete and up-to-date work on this subject, and has been written for all engaged in the practice of steam, vapor, hot-water heating, and ventilation. The author has spent over thirty-five years in the heating trade and his experience covers every angle of the business.

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For the Preservation of Richardson's Famous Allegheny County Jail Building, Pittsburgh

To the Editor of "Architecture,"
New York, N. Y.

Dear Sir: The Pittsburgh Chapter of the American Institute of Architects has noted with concern the proposal to destroy the Allegheny County Jail building. This organization has studied the subject with care and wishes to submit herewith certain specific and practical suggestions which are designed (1) to clear off some of the area now occupied by the jail structure, as a concession to traffic needs; (2) to make a modification of the present use of the structure; and (3) to retain the original and most interesting portion of the structure as a combined utilitarian building and architectural monument.

Recommendation No. 1. It is recommended that the present Allegheny County Jail building be restored to its original area and exterior condition as designed by Henry Hobson Richardson, one of the greatest American architects, and that the interior of the original Richardson jail be remodelled to serve as a county "hall of records."

Recommendation No. 2. It is recommended that such a solution of the thoroughfare, bridge approach, and kindred city-planning problems of the jail locality be adopted as will adequately meet the city's present and future traffic requirements and will not prevent the restoration of Richardson's architectural masterpiece as a necessary, utilitarian, and dignified building. It is confidently asserted that this building will prove a credit to the municipality and an appropriate companion to both the adjacent public buildings and to the mercantile developments that will inevitably follow the completion of the Liberty Bridge.

With respect to these recommendations, the Pittsburgh Chapter of the American Institute of Architects desires to say:

(*a*) The accumulation of public records has made the question of their safe and accessible housing in a "hall of records" an obligation not much longer to be neglected. The cost of acquiring an expensive site near the court-house, together with the cost of erecting a suitable hall of records building, might be expected to agitate the taxpayers if the present suggestion were not so pertinent and satisfactory.

(*b*) To restore the jail building to Richardson's original design will necessitate the removal of the forbidding-looking wall of the jail yard, the diagonal northeast wing, parts of the north wing and the east wing, and, perhaps, some other minor portions.

(*c*) It is granted, of course, that the encroachment of the jail structure upon Diamond Street should be corrected.

(*d*) The Pittsburgh Chapter A. I. A. is concerned to tender its services to public officials, in advisory capacity, during the development of the suggested alterations, so that a great architectural monument may not be unduly mutilated or destroyed; or this chapter will undertake to promise, on behalf of its parent body, the American Institute of Architects that an advisory committee will be appointed for the same purpose by the president or board of directors of the institute.

The Pittsburgh Chapter has been careful to ascertain that a feasible plan, meeting the conditions of the chapter's second recommendation, has actually been devised. No doubt this plan will be made public at the proper time by the City Planning Commission, inasmuch as that department of the city government is now engaged, by direction of the City Council, in developing general plans of which the plan here mentioned is a part.

The subject-matter of the present communication has been given very careful study by this chapter and by a special committee appointed for the purpose. A formal resolution of the chapter is, for your further information, quoted in full as follows:

"Whereas, The group of buildings known as the Allegheny County Court-House and Jail has been for years recognized, in this and foreign countries, as an American architectural monument of outstanding merit; and its architect, Henry Hobson Richardson, who is placed among the greatest architects of this country, regarded this group as his best work; and

"Whereas, Recent serious proposals to destroy the jail portion of this masterpiece have been given considerable commercial publicity; and

"Whereas, There appears to have been no serious attempt to reconcile the alleged objections to the present use of the jail building and various municipal requirements;

"*Therefore Be It Resolved*, That the Pittsburgh Chapter of the American Institute of Architects present to the proper public officials and to local civic bodies the proposal to reduce the jail structure to its original extent and exterior condition and to remodel the interior to serve as a much needed hall of records, to the end that this architectural masterpiece may be conserved to future generations of Americans as an historic and cultural asset."

Very truly yours,
Howard K. Jones, *President.*
Thomas W. Ludlow, *Secretary.*

Welcome, Mr. Whitehead

It is with pleasure that we read the announcement in the November number of *Pencil Points* of Mr. Russell Whitehead's assumption of the editorship of that interesting and progressive journal for the drafting-room. His exceptional experience and fine taste will add further strength to its pages.

Announcements

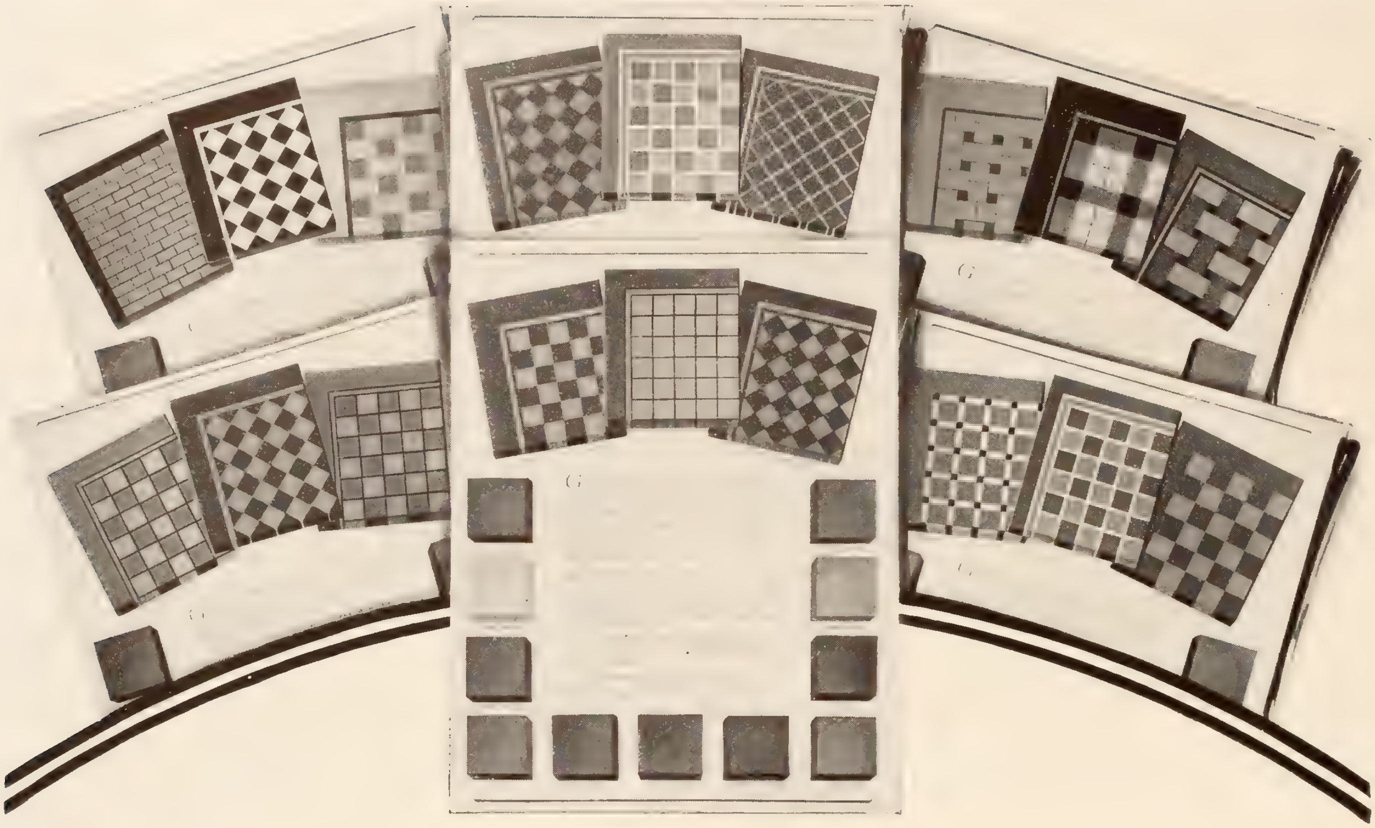
Hubert Marion Garriott and William Gregory Rammel have severed connections with the firms Allen & Garriott, Indianapolis, and Allen, Garriott & Rammel, Logansport, Ind., and will continue the practice of architecture under the style of Garriott & Rammel, architects and engineers, with new offices at 1151–52 Consolidated Building, Indianapolis, and 4 Masonic Building, Logansport, Ind. New catalogues and samples are desired in both offices.

Hugh T. Keyes, architect, has moved his office to 635 Free Press Building, Detroit.

Randolph H. Almiroty, architect, announces that his offices are now located at No. 2 West 45th Street, New York City. Telephone No. Murray Hill 4990.

D. Wentworth Wright wishes to announce that he has opened an office at 9 Highland Place, Maplewood, N. J., for the practice of architecture, specializing in residential work. Catalogues requested.

Robert B. Crowe, member American Institute of Architects, Tampa, Fla., has opened an office for the practice of architecture, suites 2 and 3, Plaza Building, Tampa, Fla. Manufacturers' catalogues and samples desired.



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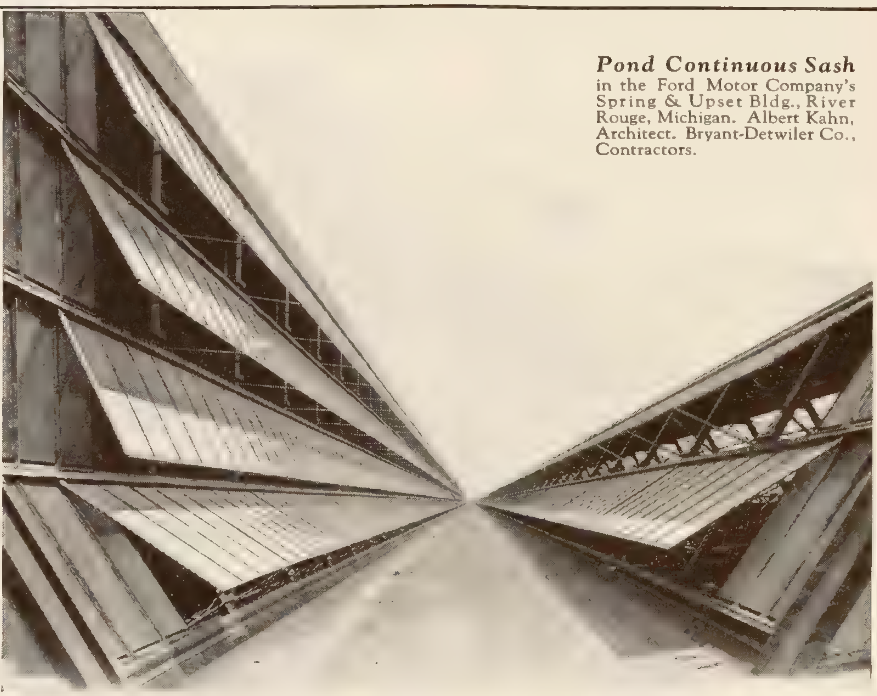

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Originally designed for use in roofs, Pond Continuous Sash is equally useful in side walls. It is particularly effective in connection with Pond Roof Design and Pond A-Frames.

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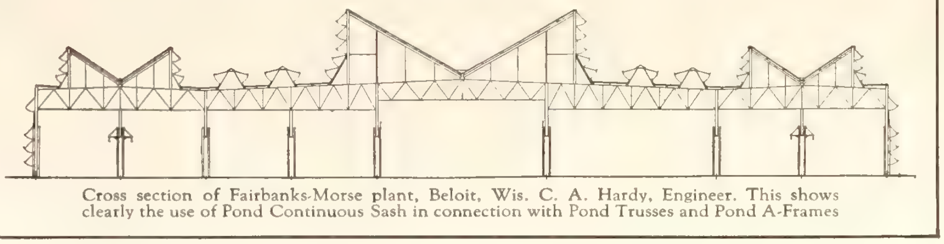
DAVID LUPTON'S SONS COMPANY
Allegheny and Trenton Aves., Philadelphia, Pa.

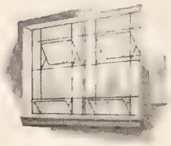
Atlanta	Boston	Chicago	Dallas	Los Angeles	New York
Baltimore	Buffalo	Cleveland	Detroit	Newark	Pittsburgh



Cross section of Fairbanks-Morse plant, Beloit, Wis. C. A. Hardy, Engineer. This shows clearly the use of Pond Continuous Sash in connection with Pond Trusses and Pond A-Frames

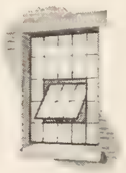
Other types of Lupton Windows

Projected Sash



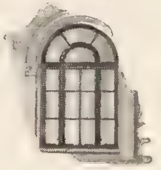
First made by Lupton, this type of sash has met with constantly increasing popularity for factories, office buildings and schools. Easily operated ventilators stay open in any position. Made in Architectural and Industrial styles.

Pivoted Sash



The standard and accepted steel window for factories, stores, garages, warehouses and all sorts of business buildings. Rigidly built of solid copper-steel rolled sections. Made in 25 stock sizes for immediate shipment.

Heavy Casements



The highest grade steel windows for banks, libraries, clubs, office buildings or fine residences. They are made in six standard types and can be furnished to suit any size or shape of opening.

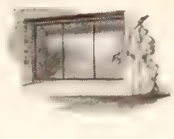
Counterbalanced

These windows make balanced ventilation automatic. When the lower sash is opened, the upper sash lowers an equal distance, thus providing an entrance for fresh air and an exit for exhausted air at the same time.

Residence Casements

Lupton residence casements embody a charm of line and a practicability of detail found in no other makes. Rigid, weathertight, and easy to install. Made in a variety of standard sizes to suit all requirements.

Basement



Lupton basement windows have transformed the lower part of the house to a bright, airy place. They give practically double the light of old-fashioned wood windows and never stick, rattle or warp. Made in four standard sizes.

Residence of Fletcher Cowherd, Jr., 6140 Morningside Drive, Kansas City, Mo.; Selby H. Kurfiss, Architect, Kansas City; Kohler Plumbing Fixtures furnished by U. S. Water & Steam Supply Co., Jobbers, Kansas City; installed by C. W. Herold Plumbing & Heating Co., Plumbers, Kansas City

THE Fletcher Cowherd Co., Kansas City, Mo., builds fine homes, equipping them, almost always, with Kohler Plumbing Fixtures.

In building for himself, the vice-president of this company, Fletcher Cowherd, Jr., made the same selection. His home on Morningside Drive has Kohler Ware in its five bathrooms and in its kitchen.

This beautiful ware has a special distinction, conferred by grace and dignity of design and by rare quality of enamel—always identified by the name "Kohler" faintly fused in the immaculately white surface. Yet it costs no more than any comparable ware.

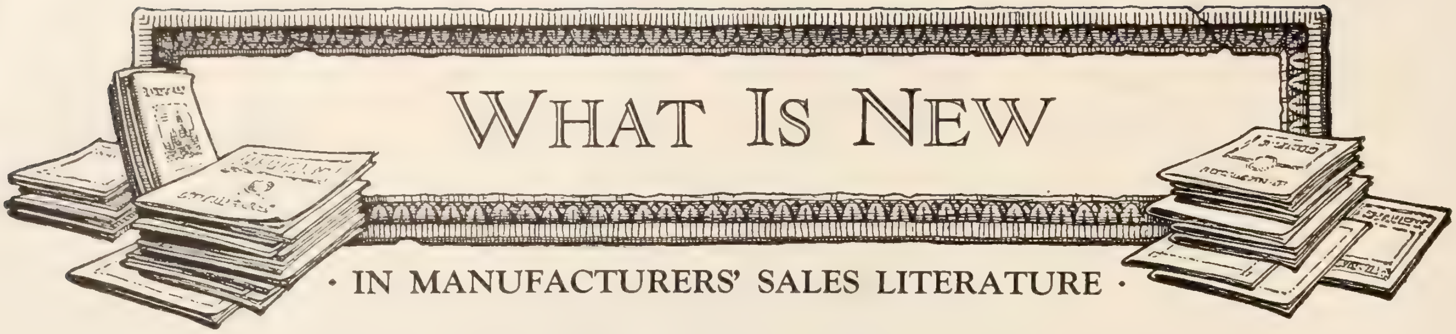
It is a sound choice, this Kohler Ware, alike for the man who builds to keep and for him who builds to sell. There is genuine satisfaction in specifying it.

A Notable Community

The modern conception of the "city plan" is shaping the growth—in orderly beauty and civic purpose—of Kohler Village, where Kohler plumbing fixtures and private electric plants are made

KOHLER CO., *Founded* 1873, KOHLER, WIS.
Shipping Point, Sheboygan, Wis. · *Branches in Principal Cities*

KOHLER OF KOHLER
Plumbing Fixtures



WHAT IS NEW

· IN MANUFACTURERS' SALES LITERATURE ·

Architects and every one interested will find here the latest and most up-to-date information on building equipment. These publications may be had by addressing SERVICE DEPARTMENT, ARCHITECTURE, 597 Fifth Avenue, New York, or by addressing the companies listed below, in which case please mention ARCHITECTURE

THE NEW ELECTRIC BATHROOM HEATER

The new Prometheus electric bathroom heater is of the convection type. It warms a large volume of air and keeps it circulating. Circular "A" describes it fully.

VENTILATORS FOR BUILDINGS

The Ventilouvre Co. of Bridgeport, Conn., have developed and are distributing a new horizontal adjustable metal ventilator. This is shown in their new catalogue as being an outgrowth of their former vertical Ventilouvre which they have supplied the building trade for several years. The new device is patented, and has been given the trade name "Panelouvre." It is extremely practical and economical, and is designed as a means of assisting natural ventilation by placing it directly in the panels of any type of door, in existing or in new construction.

"HOLLOW METAL DOORS AND TRIM"

The new 160-page Art Metal catalogue will be sent to executives in architects' offices at their request.

A HANDBOOK FOR THE ARCHITECT

Bulletin No. 134-A is prepared as an aid in writing specifications for Duriron corrosion-proof pipe, fittings, etc. It contains working drawings of this material.

IN THE SPANISH STYLE

"Alpha Aids" in its issue No. 43 contains interesting elevations and plans of a cement house in the Spanish style. W. P. Brinkloe is the architect.

"STUDIES IN POLYCHROMY"

This interesting article by Leon V. Solon describes the treatment of Romanesque design with terra-cotta in color. The article is published in the October issue of "Atlantic Terra Cotta."

ASSOCIATED TILE MANUFACTURERS

Of unusual interest to architects are the series of Architectural Monographs on Tiles and Tilework. No. 3 has lately been issued on the "Architectural Ceramics of Persia: Ancient, Mediæval, and Modern."

HOLTZER-CABOT ELECTRIC CO.

"Fifty Years: 1875–1925" is a handsome new book published by this concern in commemoration of its fiftieth anniversary. After the lapse of fifty years they pause for the moment to take account of their splendid progress and position.

COPPER & BRASS RESEARCH ASS'N

Architects will always find interesting ideas in the Bulletin, published monthly by this association. They will gladly place your name on their list.

OAK FLOORING BUREAU

Oak flooring literature of interest to architects includes: "The Story of Oak Floors," "How and Where to Use Oak Floors," "Hotels and Oak Floors," "School Buildings and Oak Floors."

"JACKSON WINDOWS OF BRONZE"

An unusually handsome catalogue has been published by the Wm. H. Jackson Co., of Brooklyn, showing photographs and drawings of their product.

THE "G. E. MONOGRAM"

Every month finds a wealth of interesting information in this magazine, published monthly by General Electric, Schenectady. The November issue contains "And Forty-five Years From Now—?" contrasting the old and the new in electrical developments.

"DUST ENGINEERING"

"Dust Engineering" is a comparatively new branch of applied science. The practical object of "Dust Engineering" is to develop methods, processes, and apparatus for the elimination of dust.

In the pages of the catalogue published by Midwest Air Filters, they have endeavored to describe some of the practical phases involved, and to show methods and apparatus now available, for fighting dust.

"WATER SOFTENING"

This bulletin published by the National Lime Ass'n contains 48 pages of extremely interesting and valuable information, easily read and well illustrated. The treatment of the subject is nontechnical as far as possible, and the bulletin will be of interest and value to all those who have anything to do with water treatment.

"BUILDING ECONOMY"

This publication in its November issue contains a pertinent article on how "Economy Wall Bungalows Promise New Era of Building in South."

"WHAT PRICE PROGRESS?"

The Chemical Foundation has reprinted this article, by Hugh Farrell, in booklet form. It deals with the stake of the investor in the development of chemistry.

NEW METHOD OF PROCESSING WROUGHT IRON

That the inventive genius of the American engineers is constantly at work to reduce manufacturing costs by substitution of machinery for manual labor is again evidenced as the result of the annual meeting of the American Iron & Steel Institute of New York, which forecast considerable reduction in building costs in consequence of the perfection of a new method of processing wrought iron.

WESTINGHOUSE ELECTRIC CO.

A new booklet on Westinghouse C. L. Carbon Circuit-Breakers for Industrial Applications has just been issued.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION

"Co-operation Solves Problems of Distribution," by Charles F. Abbott, Secretary of the Institute, contains a great deal of interest to architects.

HOLLOW WALLS OF BRICK AND HOW TO BUILD THEM

This 24-page illustrated publication, just off the press, contains complete information on types of the Ideal wall now generally familiar, and also includes full data on new types of the Ideal wall which, it is stated, can be very quickly laid and built at a remarkably low cost. The Ideal wall is constructed by laying some or all of the brick on edge.

BUREAU OF STANDARDS

"Tests of Hollow Tile and Concrete Slabs Reinforced In One Direction" has recently been published by the Bureau of Standards.

NEW YORK TERRA-COTTA CO.

This concern is issuing a reprint of Major Laurence's article in the November issue of ARCHITECTURE on "The Passing of Delmonico's."

JOHNS-MANVILLE

This concern is issuing to architects their fine book, showing the various color combinations of Asbestos Shingles.

AUSTRAL WINDOW CO.

Some copies of this company's treatise on "School Ventilation" are still available. Architects may have them by writing on their letterheads.

INDIANA LIMESTONE

"Portfolio of House Designs" is one of the most valuable collection of designs that we have seen for the profession.

HART & HEGEMAN

The H & H Architect's Handbook on electrical fixtures is of interest to architects.

NATIONAL TUBE CO.

Details on the "Scale Free" Process for pipes are disclosed in Bulletin No. 7.

ERKINS STUDIOS

Designs, estimates, or catalogue for gardens and garden ornaments will be sent on request.

GENERAL CHEMICAL CO.

A booklet describing "Hard-n-tyte" Colorless Waterproofing will be gladly sent to architects.

"SHOW WINDOW LIGHTING"

The Pittsburgh Reflector Co. has published under this title interesting facts for the profession.

"BRUCE: EVERY MONTH"

In the November issue of this house-organ is the article by E. H. Brown, A. I. A., concerning "The Improving Architecture of Small Homes."

CHEMICAL TREATMENT CO.

A folder is being issued concerning "Croden," the new chrome alloy plate for plumbing and lighting fixtures.

NEW YORK BUILDING CONGRESS

A report has been issued on what the leaders in the building industry agree as to the value of winter construction.

AUSTRAL WINDOW HARDWARE

Wood-Rolled Steel Construction *Metal Covered-Hollow Metal Construction*

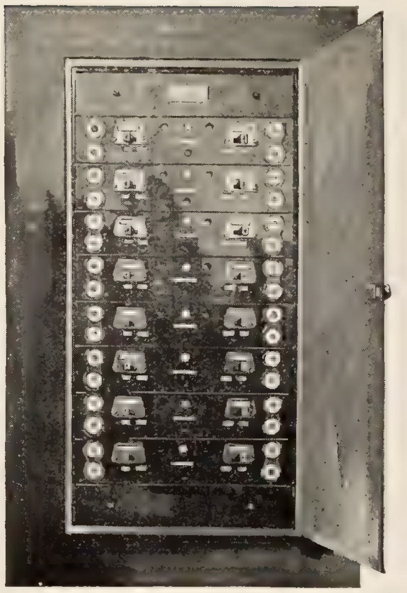
During the past two years 97 new schools in the State of Delaware have been equipped with

AUSTRAL WINDOWS.

Guilbert and Betelle were the architects and A. J. Taylor chief engineer.

At the top is the Lewes High School, Lewes, Del.; in the middle, the Odessa School, at Odessa, Del., and opposite is the Kirkwood School, at Kirkwood, Del.

▿ 101 ▿
PARK AVE
AUSTRAL WINDOW CO.
NEW YORK
▿ CITY ▿



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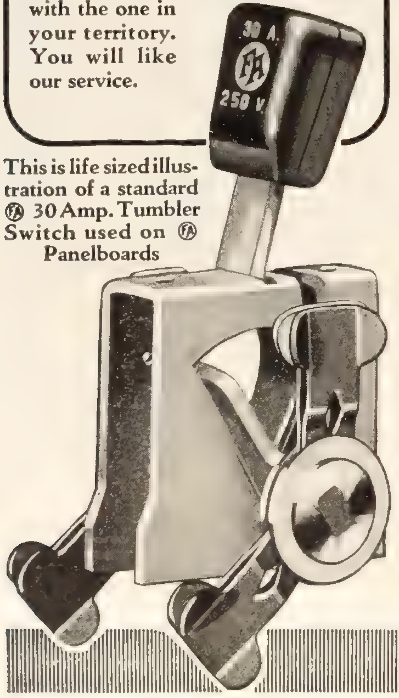
Estimates, data and helpful cooperation are furnished by each FA District office. Each is a complete unit organized to be of service to the Architect. Become acquainted with the one in your territory. You will like our service.



This is life sized illustration of a standard FA 30 Amp. Tumbler Switch used on FA Panelboards

Along with the architect, we value *his* opinion highly. *He* is the chap who runs the conduit, pulls the wire, and makes the connections. And he knows honest to goodness panelboard workmanship when he sees it.

Why shouldn't he?

He has installed every kind of panelboard capable of being specified—good, bad and "indifferent." And if he is the kind who takes pride in his work, you'll see him eye an FA Panelboard in the same pleased manner a Kentucky horseman inspects a Derby winner.

He knows FA Panelboards are more than a mere place in which to keep fuse plugs.

His recognition of skilled craftsmanship is instantaneous. He senses the service and durability that have won for FA the undisputed title, "the sign of a better job."

And that is what he calls all panelboards which carry the FA pride mark.

Compare FA Panelboards with any other brand made. And then compare the price. FA Panelboards are not only a far better job, but the cost is actually less.

May we send you a practical hand book on Panelboards—the FA Catalog? It contains a wealth of valuable information not to be found elsewhere. No cost, no obligations—just your name, please.

Frank Adam
ELECTRIC COMPANY
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CIGARETTES

"There's
something
about them
you'll like"

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They are ready to back your clients too

MANY a man who today owns a desirable piece of property is prevented from erecting on it a valuable, income-earning building by just one thing—financing. But many a man in just this position has been enabled to go ahead with his project by just one thing — the Miller Plan of Financing.

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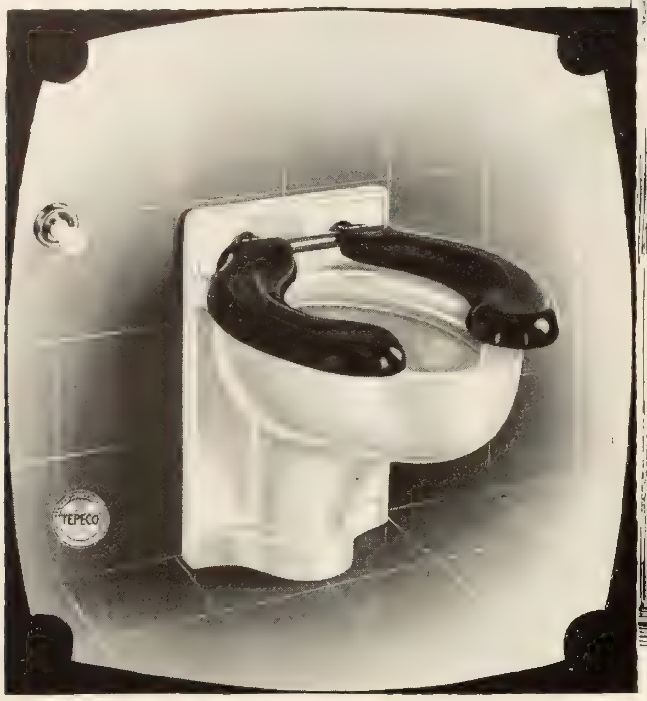

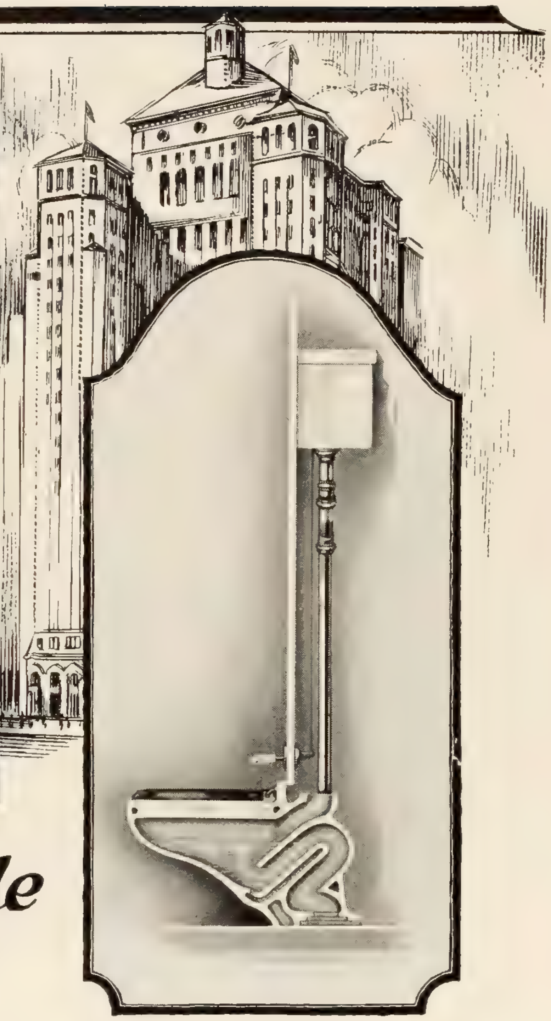

Do Your Plans Include a Pipe Chamber?

IN ALL classes of building where a pipe chamber is possible *"Universal"* Wall Closet as developed by "Te-pe-co" will be found ultimately economical.

Note in the above illustrations that the *"Universal"* has all the desirable features of the wall-hung closet plus a simplified installation that requires no carrier.

This highly sanitary fixture is of the syphon jet construction in a design that includes the extended lip feature, and a large vent passage from the bowl opening vertically into the pipe chamber.

The *"Universal"* is connected to the floor by the Donovan Safety Flange, insuring both the safest support without strain on the wall and a perfect seal at the joint.

If your plans require a closet of this type, you will gain much by consulting your jobber on the *"Universal."* Like all other "Te-pe-co" products the tank and bowl are of two-fire Vitreous China.

The
TRENTON POTTERIES COMPANY
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ALL-CLAY PLUMBING FIXTURES

The Roof *Must* Be Good!

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CASS TECHNICAL
HIGH SCHOOL
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MAIN ENTRANCE

CASS TECHNICAL HIGH SCHOOL of Detroit cost nearly four million dollars, and was opened in September, 1922.

It represents the best in design and equipment in almost every particular.

However, one vital specification was omitted.

The greater cost of Duriron drain lines, traps and waste connections from the various laboratories was not considered justified, and cast iron, wrought iron and lead equipment was installed.

What has been the result?

Lead traps from the sinks failed quickly, and were replaced with cast iron. The latter had an average life of three months. Naturally, repairs and replacements on these and the system generally were frequent, and more frequent, until, during the last months of the 1925 spring term, they were practically constant.

And despite this enormous maintenance expense, leaking acid waste has in some instances seeped through the concrete floors, and shows on the ceilings below.*

Finally, in response to urgent appeals for relief, it was decided to end this intolerable situation at once and for all time.

In July, 1925, less than three years after this school was opened, Duriron acid-proof pipe, fittings, traps, etc., were ordered and installed.

Drainage troubles from Cass Technical High School laboratories are now a thing of the past.

*Acid waste is most destructive to concrete and its reinforcement.

The DURIRON COMPANY
DAYTON · OHIO

Residence of Frederick A. Shick, West Bethlehem, Pennsylvania. C. E. Schermerhorn, Philadelphia, Pa., Architect. Roofed with IMPERIAL *Closed Shingle Tiles in Dull Green.*

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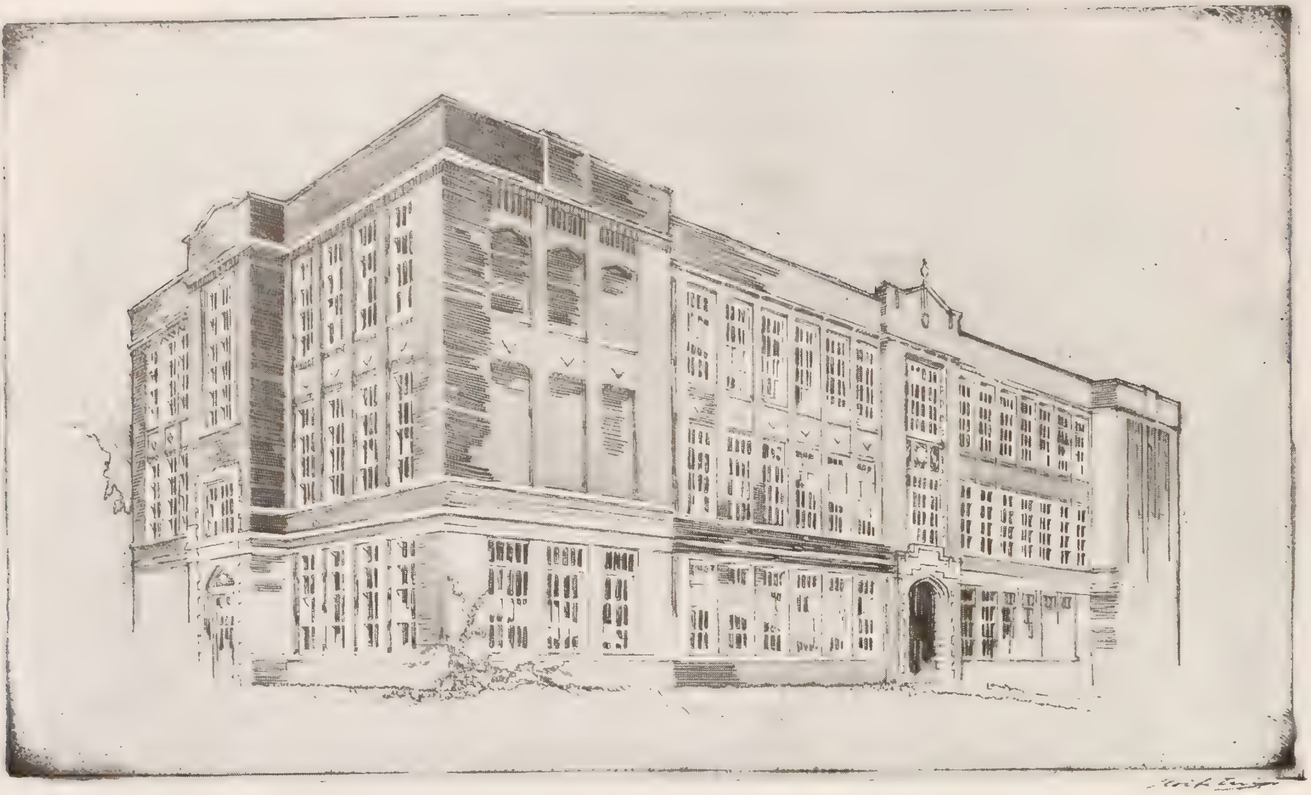

High School, Lake City, Ia., Univent Equipped, Thomas—McLennan & Thomas, Des Moines, Ia., Architects

The Perfect Unity

Beauty that is strength—and utility that is beauty—are the Architect's ideals of Unity.

For this ideal he has labored long, and reconciled elements that were at first apparently irreconcilable.

His harmonizing touch has been responsible for the modifying of methods of sanitation, lighting and ventilation until these once obtrusive, practical necessities are now contributing elements of a unified design of beauty.

Univent Ventilation—fresh-heated air from the window, uniformly distributed in each room without draft—was inspired by the Architect's ideal of Unity. We shall be glad to send a copy of "Univent Ventilation" to architects to show how admirably this more positive and effective ventilating system fits in with their architectural plan.

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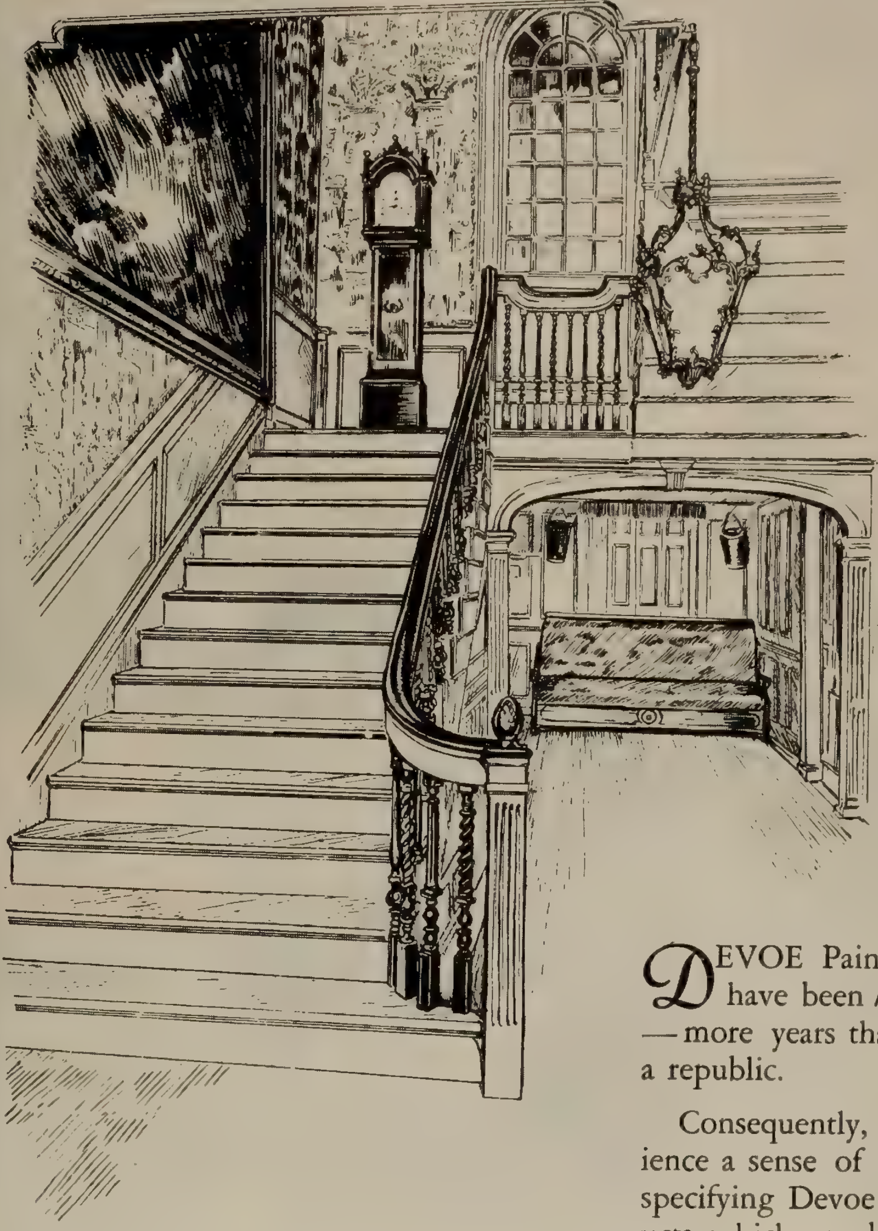

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PEPPERILL HOUSE—
Kittery, Maine. Built in
the latter part of the
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PEPPERILL HOUSE.
Showing cupboard at side.

An Improved Product for a Better Service

NO interruptions in switching-apparatus service can last more than a few moments in buildings equipped with G-E Truck Type Switchboards. A spare truck panel can be rolled into place immediately—and service resumed. The panel affected is then accessible for inspection and repair without danger.

Low Cost

For equal functions, equal safety, and equal convenience of operation the overall cost of truck panels installed is less than that of other types of switchboards.

Economy

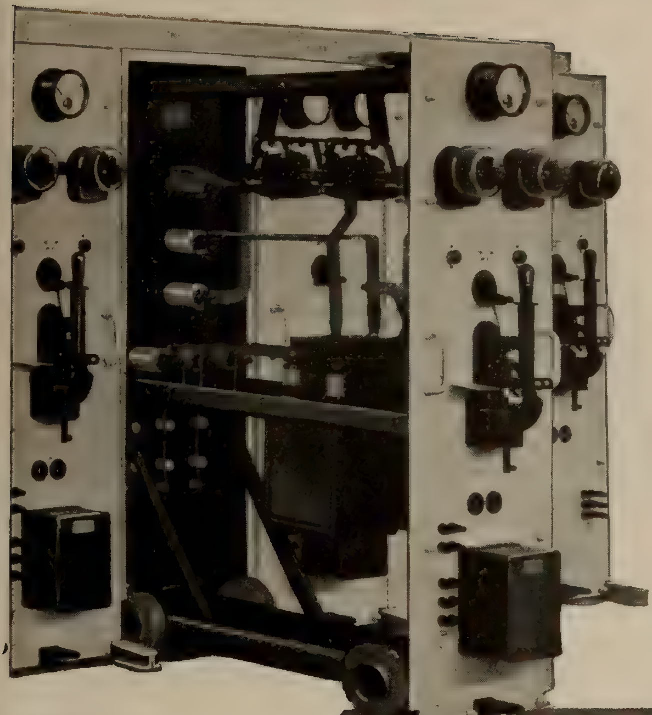
Installation, inspection, repair, and extension operations are so simplified and rendered so safe that the time for doing this work is reduced to the minimum. Losses from delays caused by a disabled switchboard are practically eliminated.

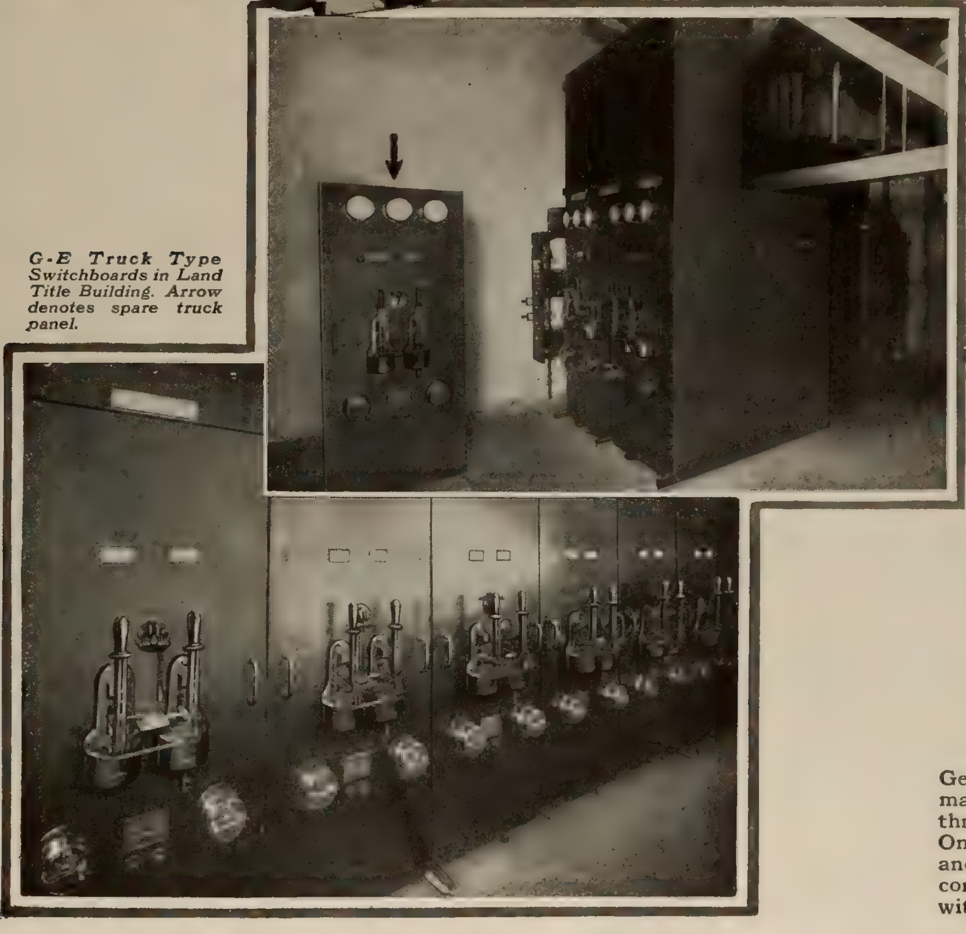
Safety to Operators

All high-voltage parts are entirely inaccessible when the truck is in its housing. When the truck panel is removed from its contacts for inspection or repair, all parts on the removable unit are electrically dead.

GENERAL

GENERAL ELECTRIC COMPANY, SCHENECTADY, NEW YORK





G-E Truck Type Switchboards in Land Title Building. Arrow denotes spare truck panel.

The Land Title Building, Philadelphia—D. H. Burnham, Architect; Harrison & Co., Engineers.

General Electric builds well, and maintains faith with its customers through consistently good service. On these two essentials—quality and service—G-E depends for continued satisfactory relations with its customers.

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The WHITE HOUSE Line

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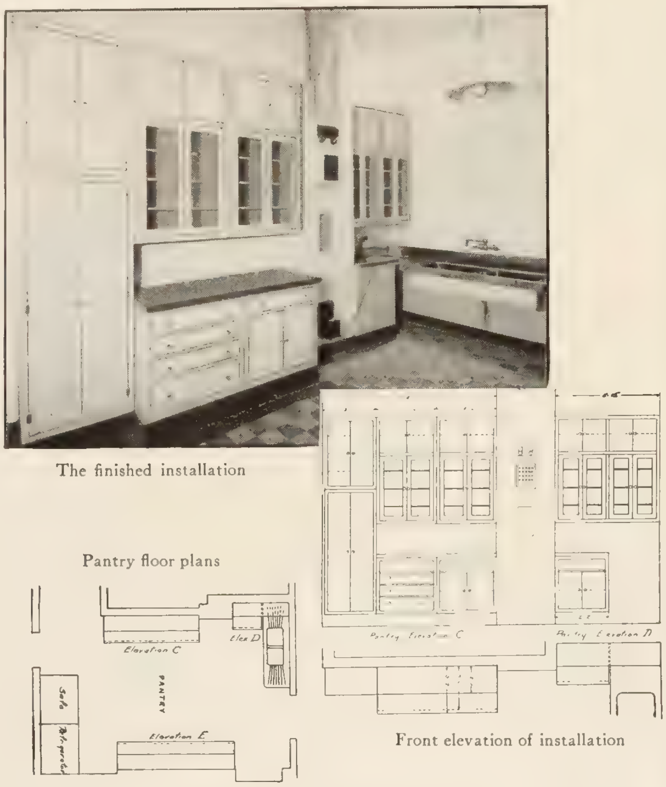

The finished installation

Pantry floor plans

Front elevation of installation

...plus intelligent co-operation

OUR Service Department will submit a detailed blue print and estimate on furnishing WHITE HOUSE Units in the kitchen and pantry of the home, the apartment, commercial and industrial building, hospital diet kitchen, domestic science department, or in fact any place where food is stored, prepared or served.

The use of steel for all of these cupboards, closets, dressers, etc., is now recognized as the most sanitary and modern equipment obtainable.

WHITE HOUSE Steel Units excel in this respect because of their construction and finish, and because they are manufactured only on a *quality* basis.

WHITE HOUSE Units are furnished complete ready for installation—no hardware, glazing or painting necessary.

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Catalogue and photographs on request.

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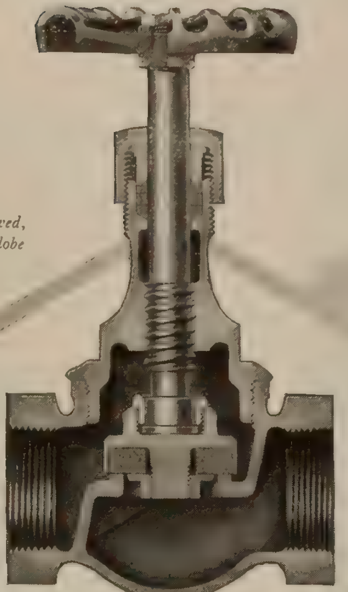
James Gamble Rogers, Architect



Sectional view, Fig. 106, screwed, Jenkins Standard Bronze Globe Valve.

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Larson and Wells, Architects

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Henry and Foulke Dormitory, Princeton University, Princeton, N. J.
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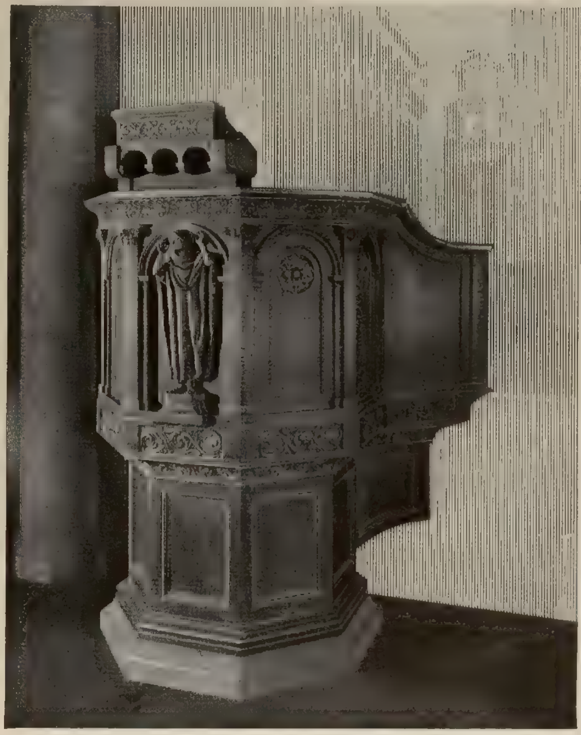

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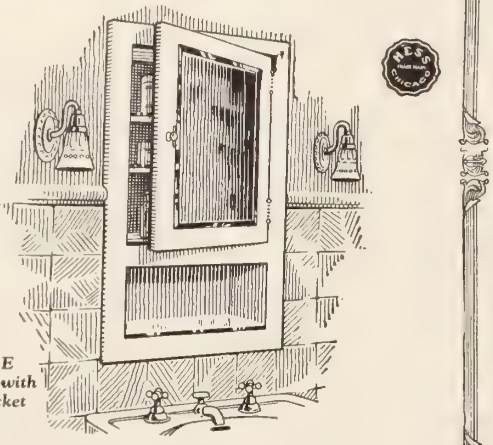
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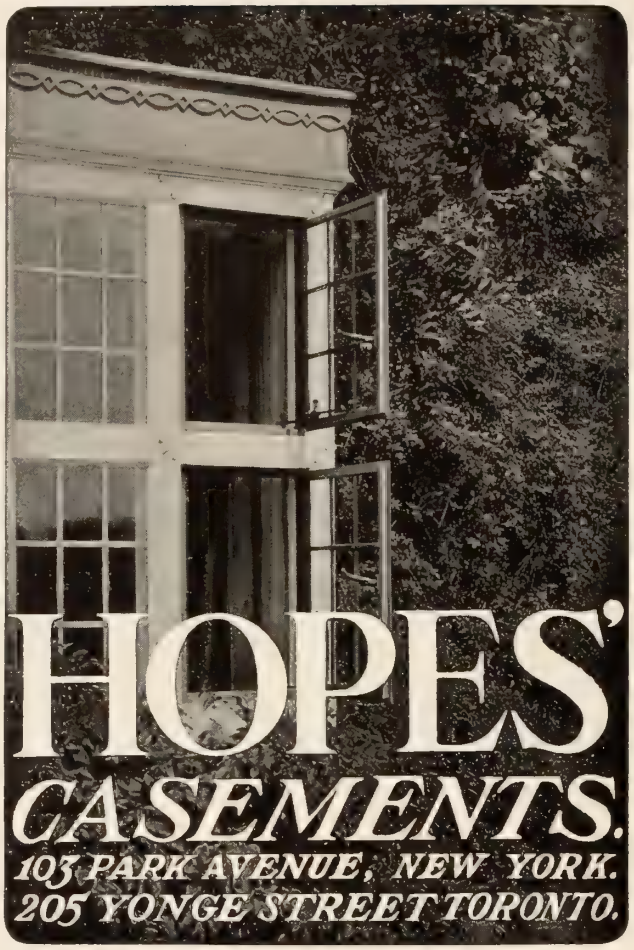
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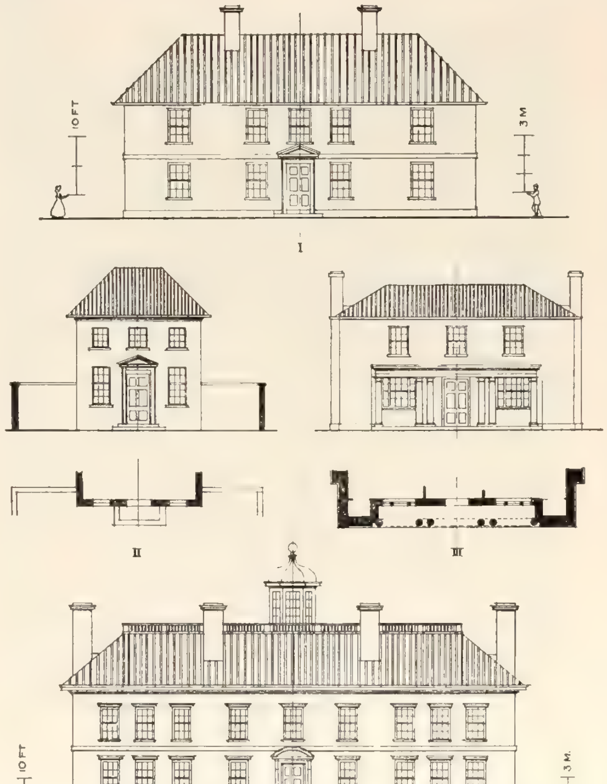

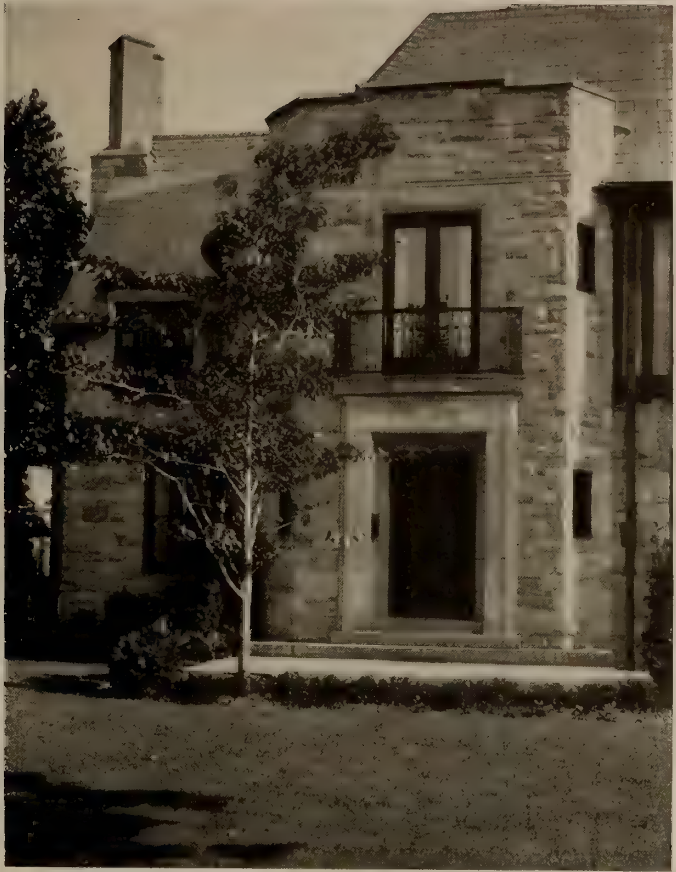

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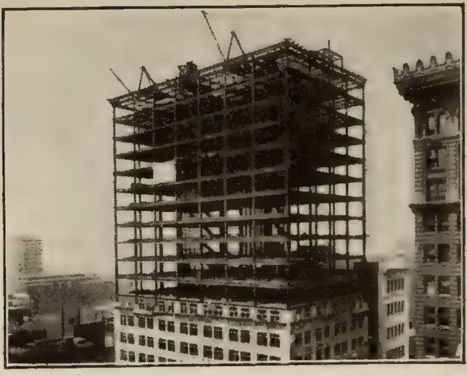

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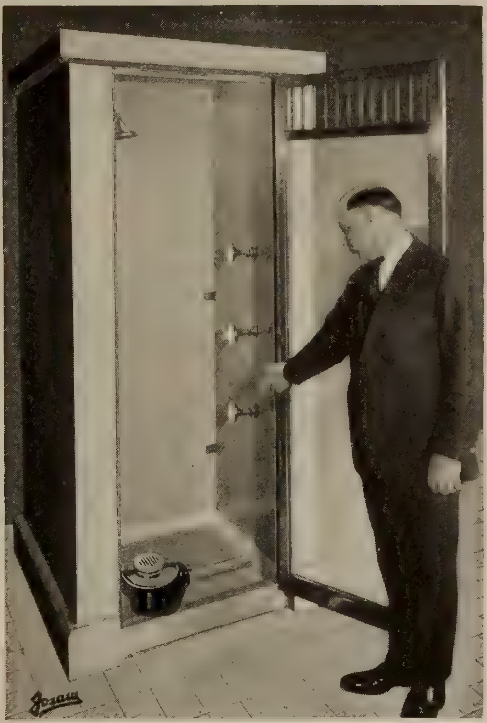

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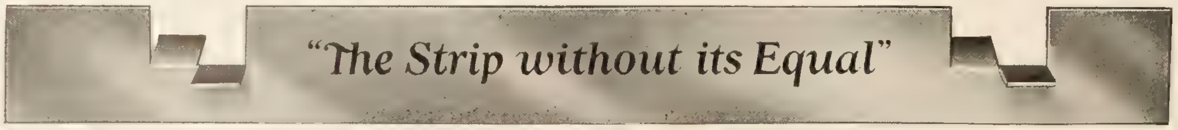
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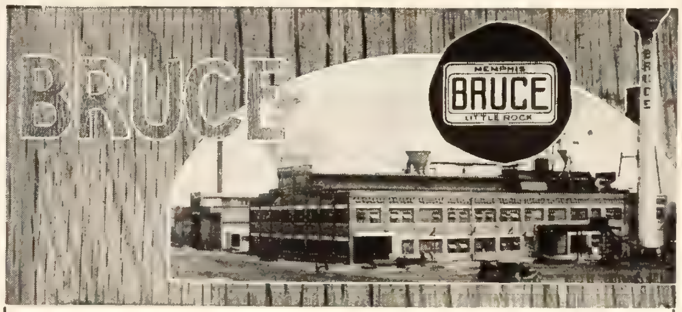

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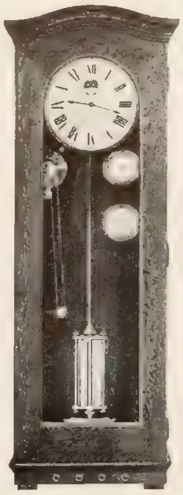

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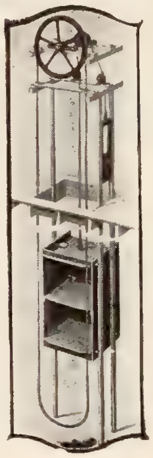

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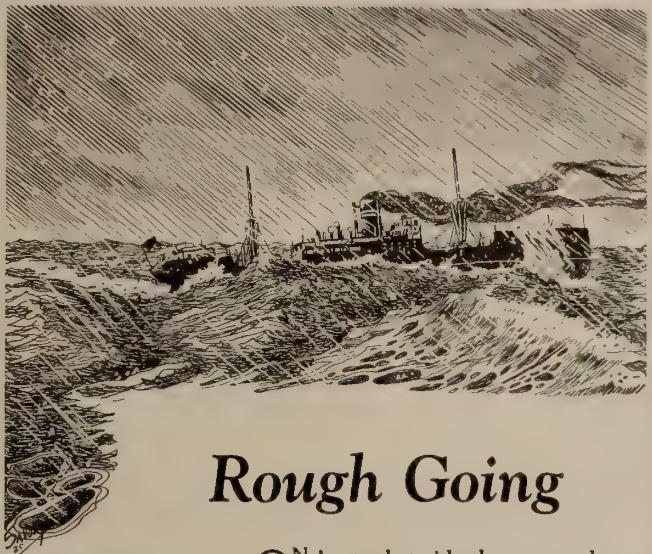

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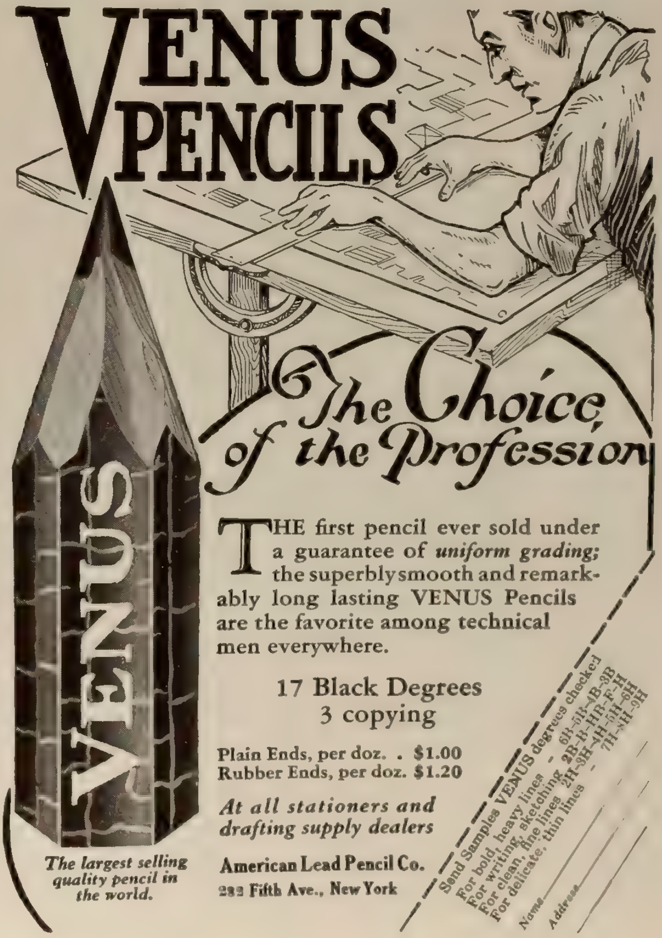

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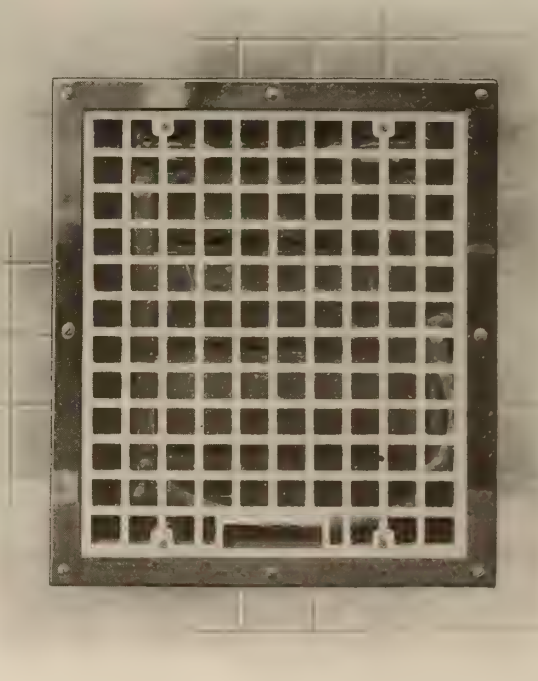

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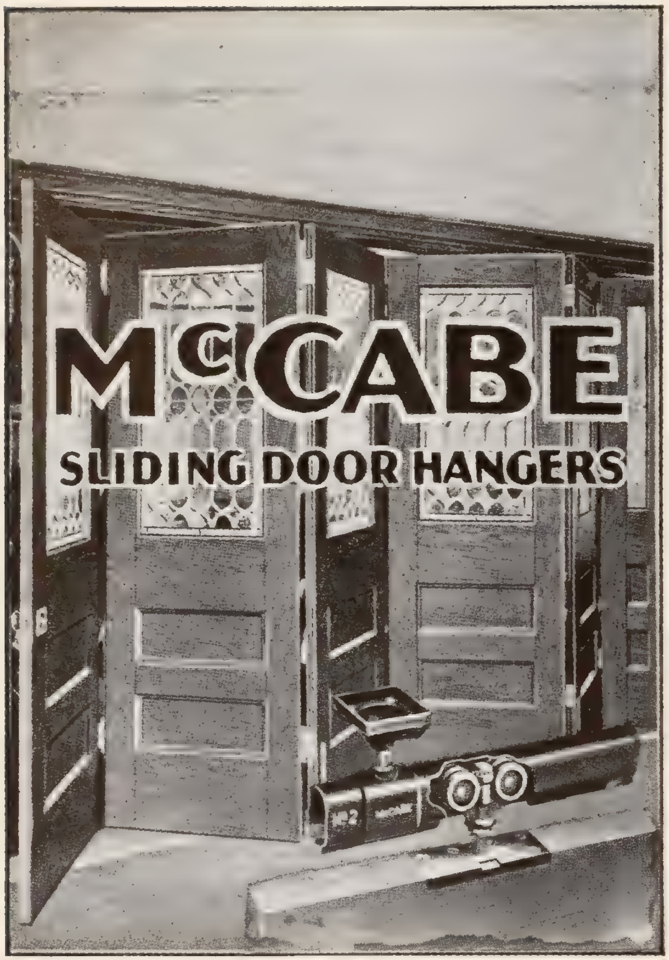

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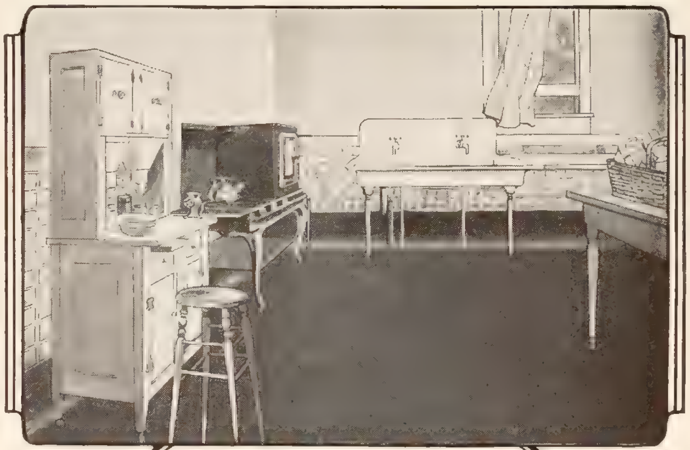

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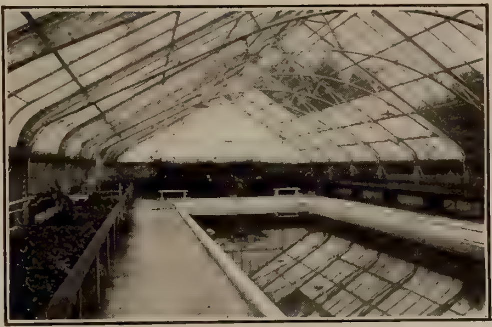

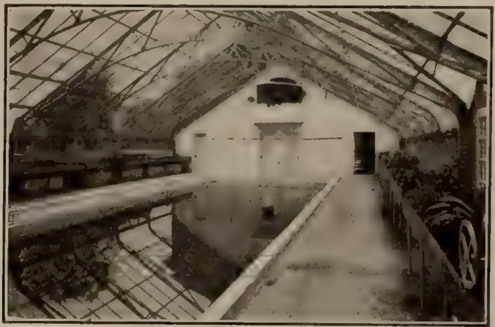

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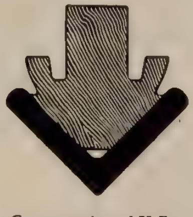

Cross-section of V-Bar construction

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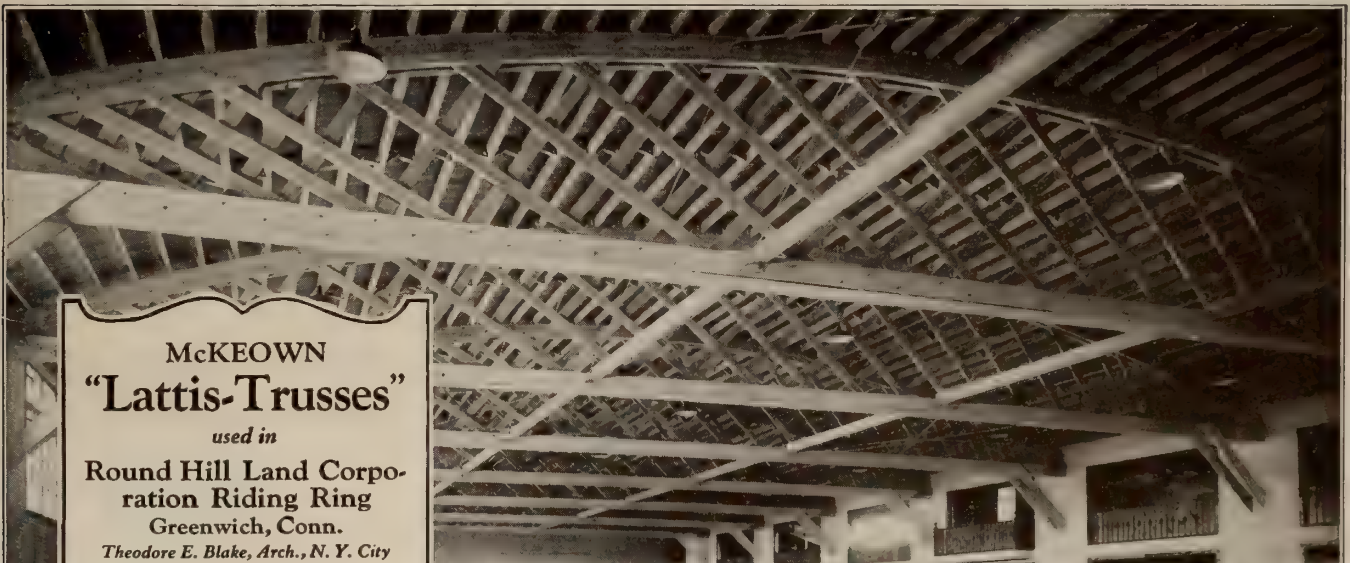

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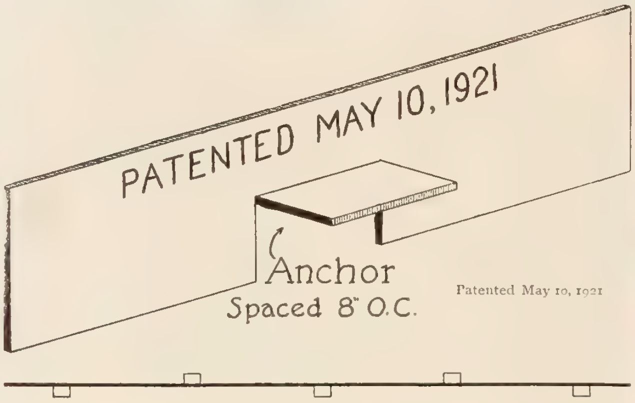

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of ARCHITECTURE, published monthly at New York, N. Y., October 1st, 1925.

State of NEW YORK, County of NEW YORK

Before me, a NOTARY PUBLIC in and for the State and county aforesaid, personally appeared CARROLL B. MERRITT, who, having been duly sworn according to law, deposes and says that he is the BUSINESS MANAGER of ARCHITECTURE, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, to wit:

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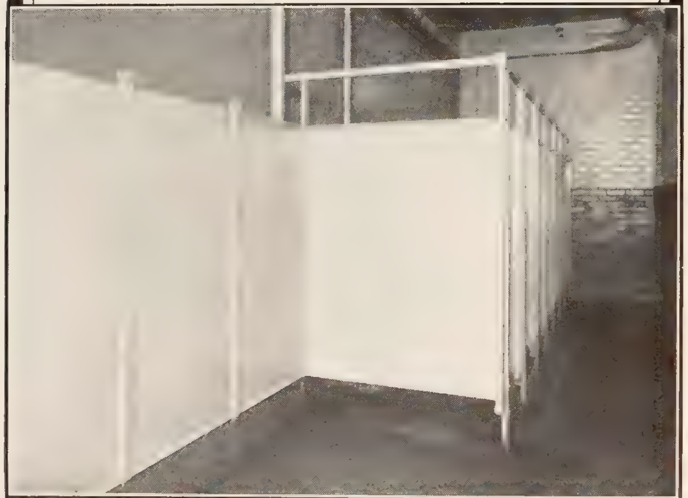

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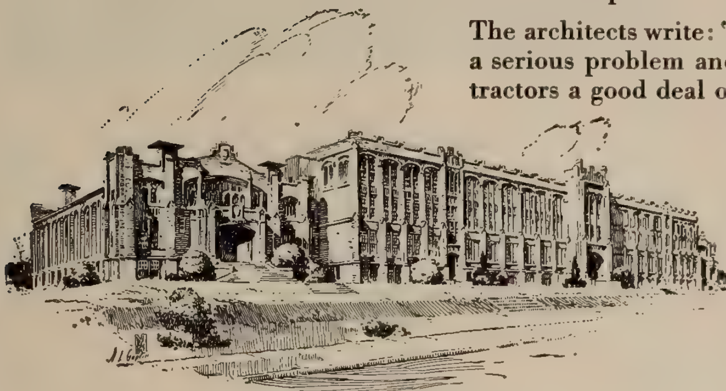

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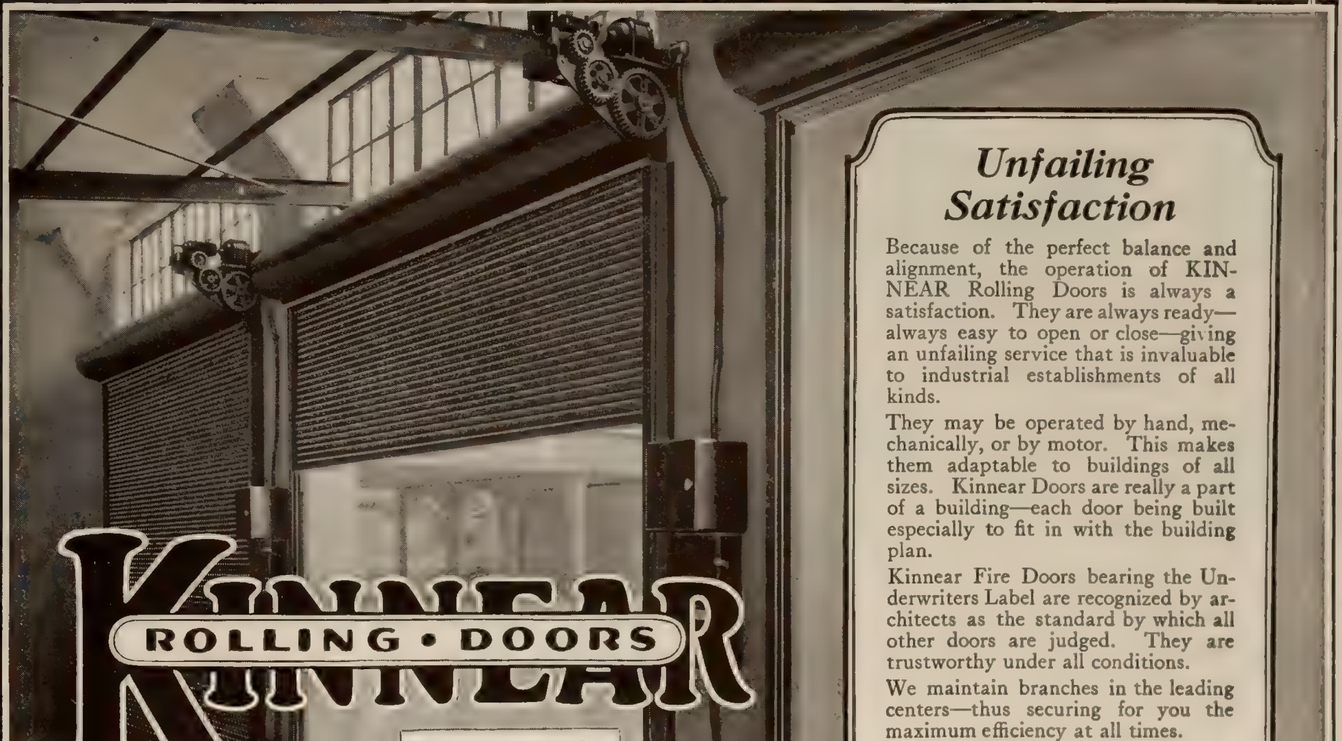

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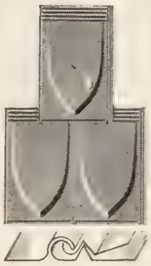

Fig 157

Note the construction of patent Interlocking Device used on Edwards Metal Shingles and Spanish Tile

Fig 367

Metal Spanish Tile for main part of roof

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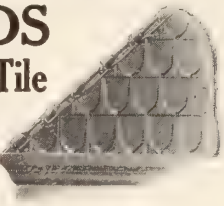

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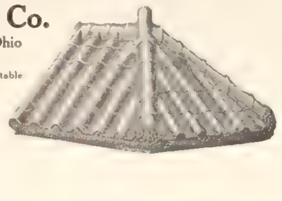

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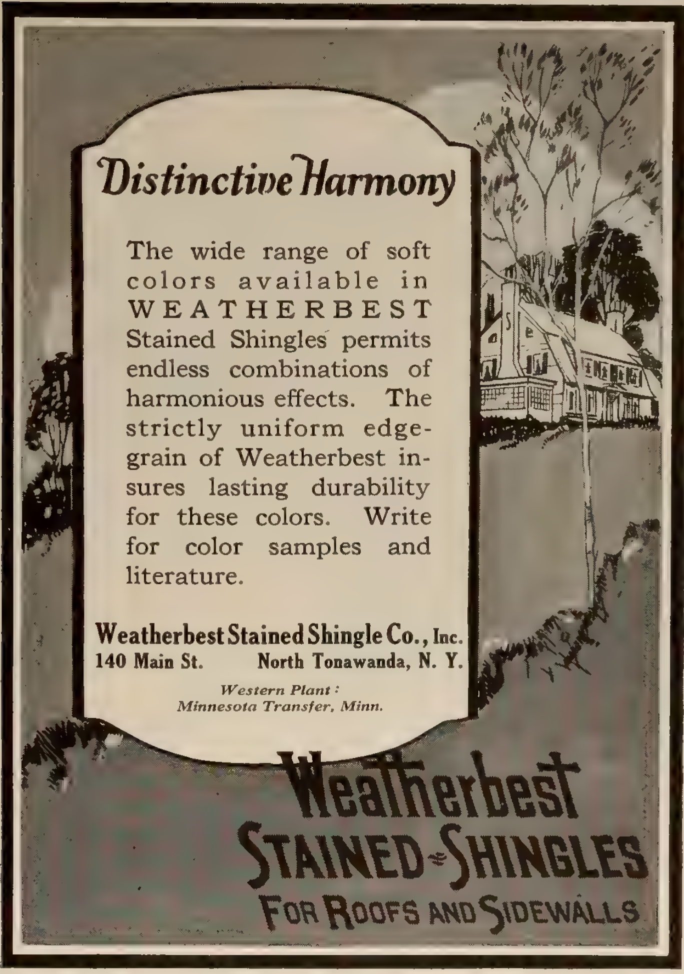

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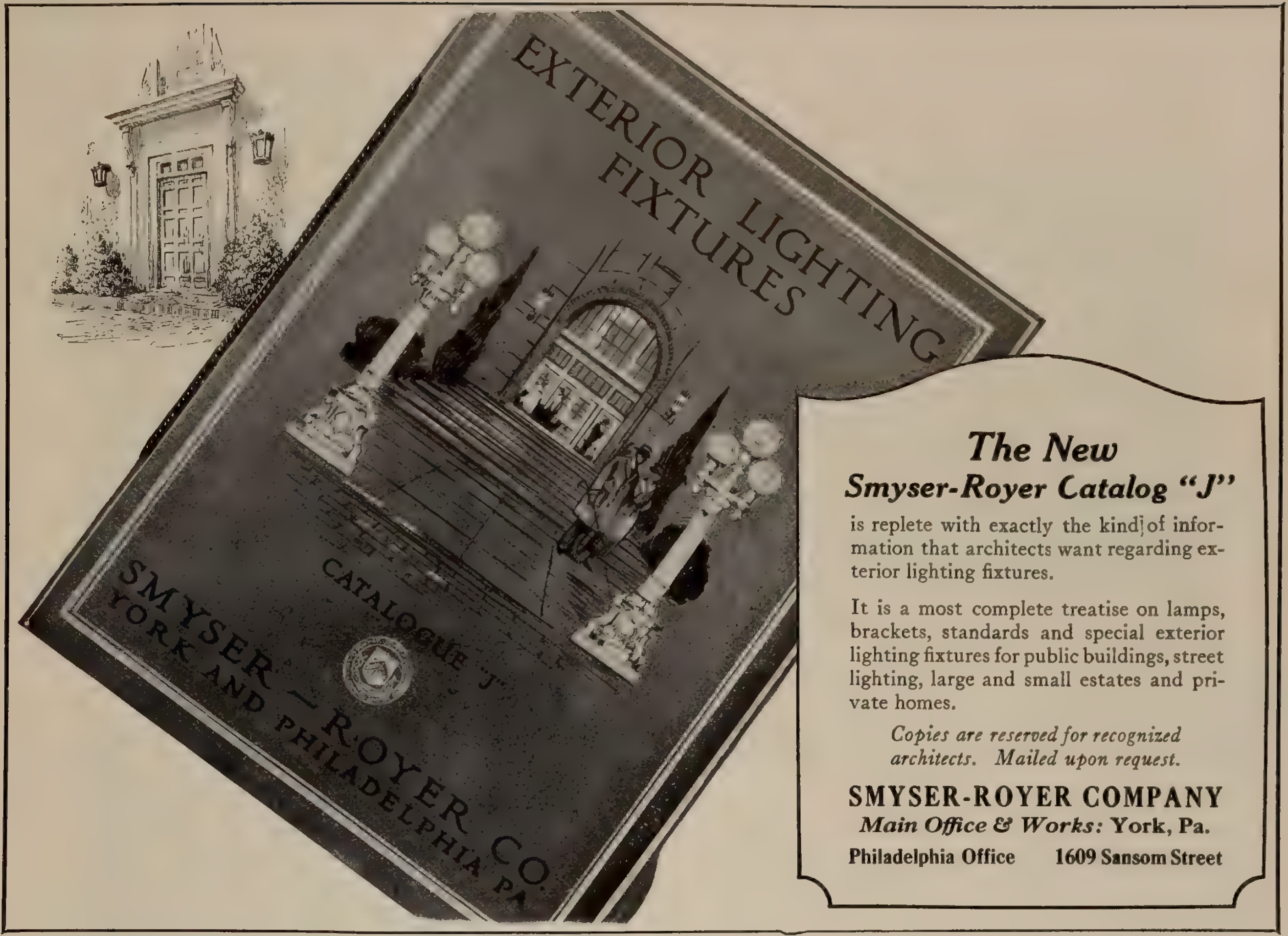
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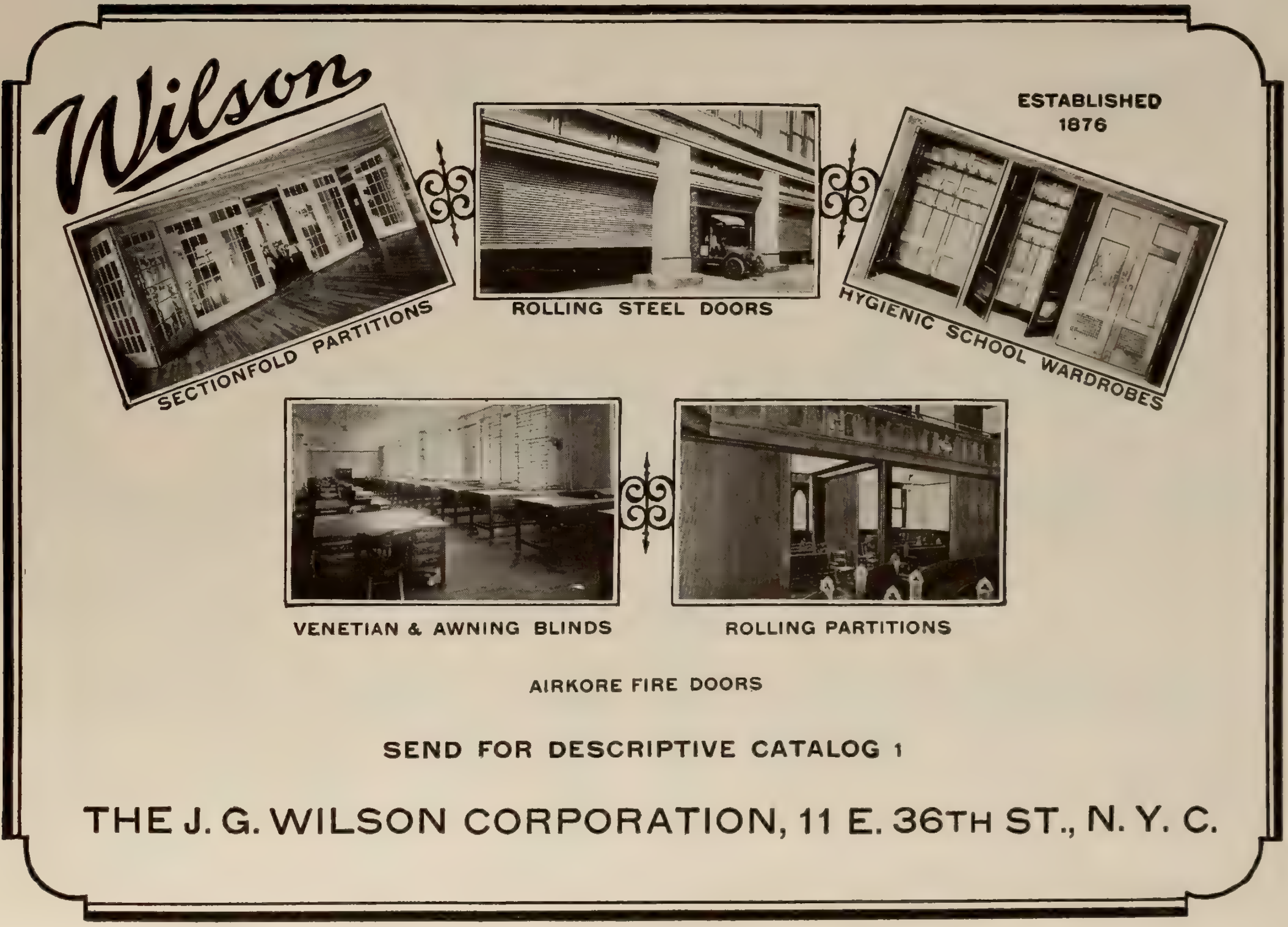
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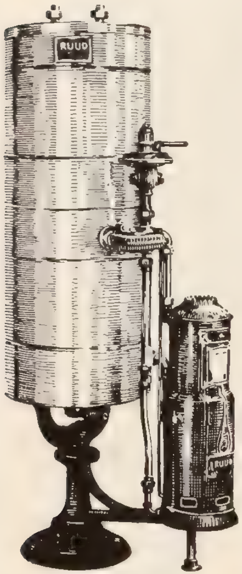

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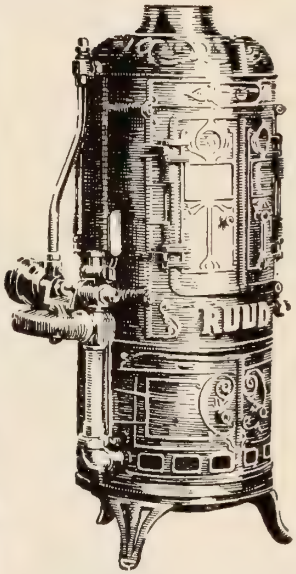

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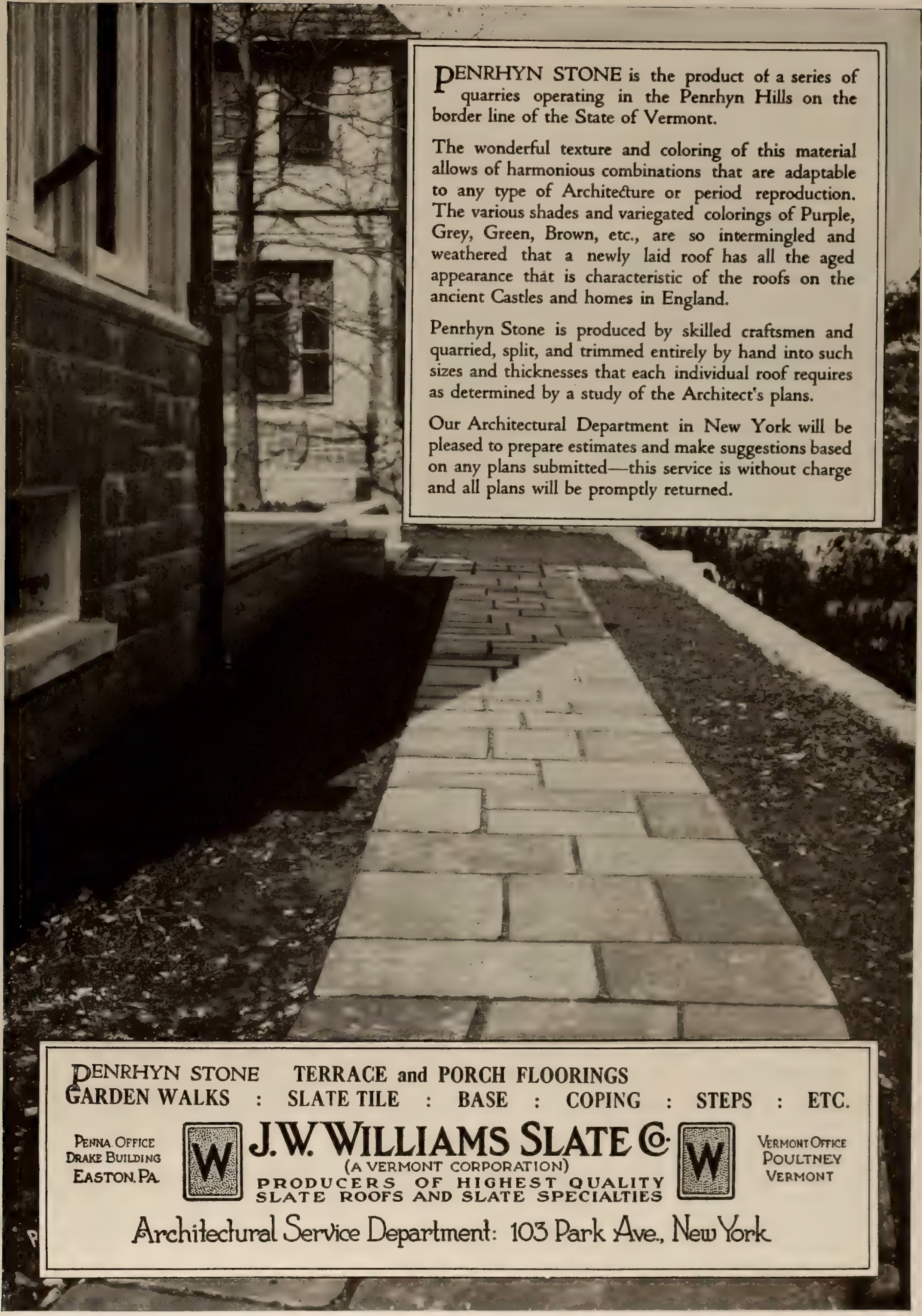

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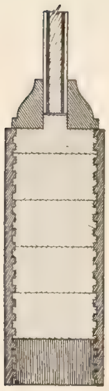

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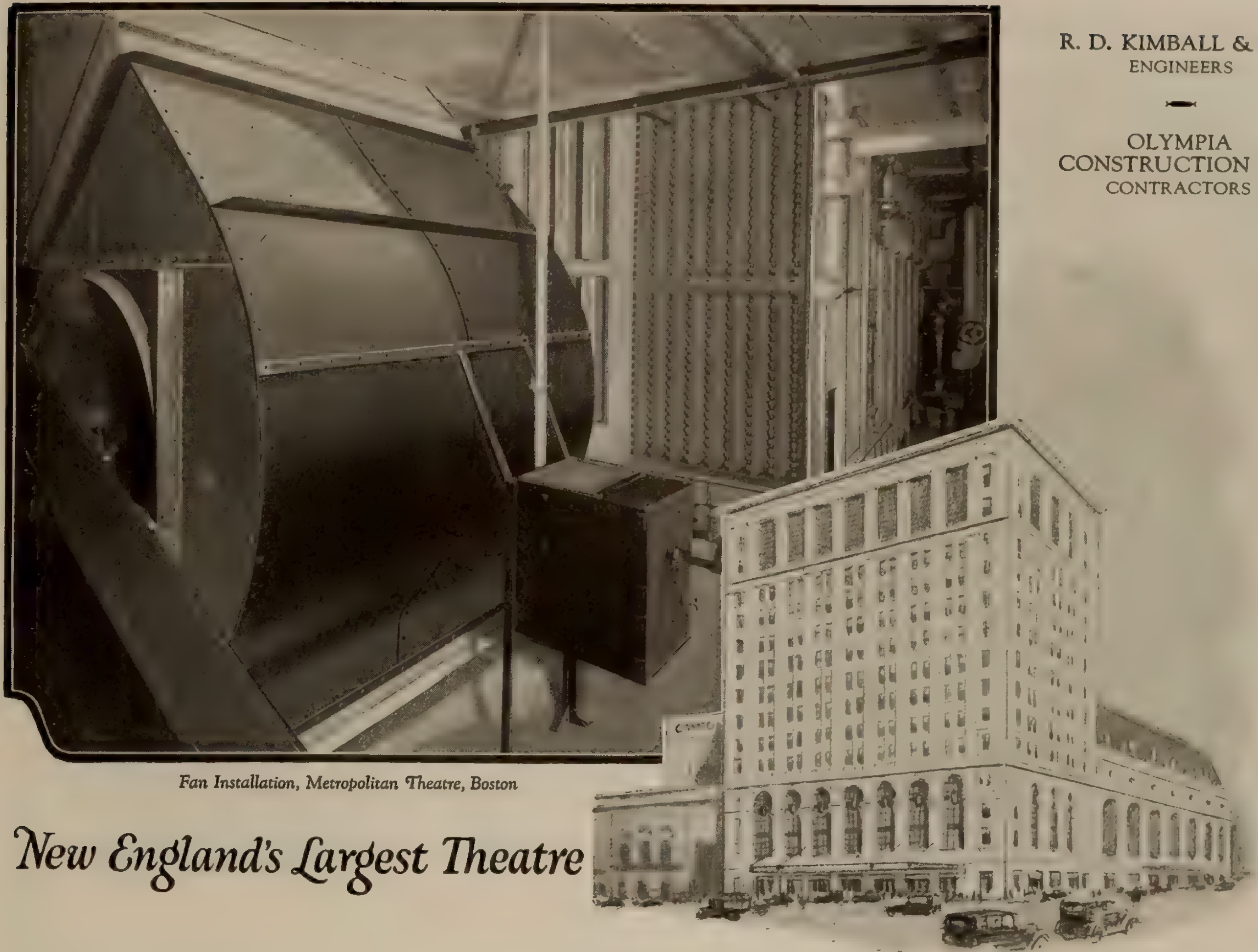

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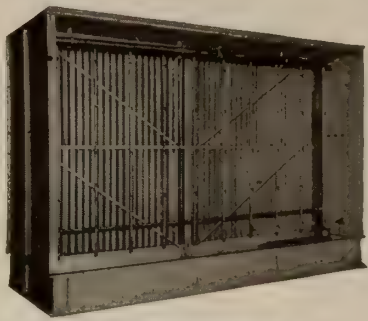

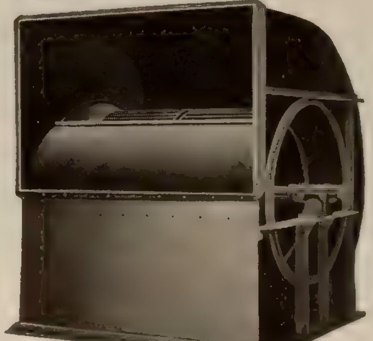

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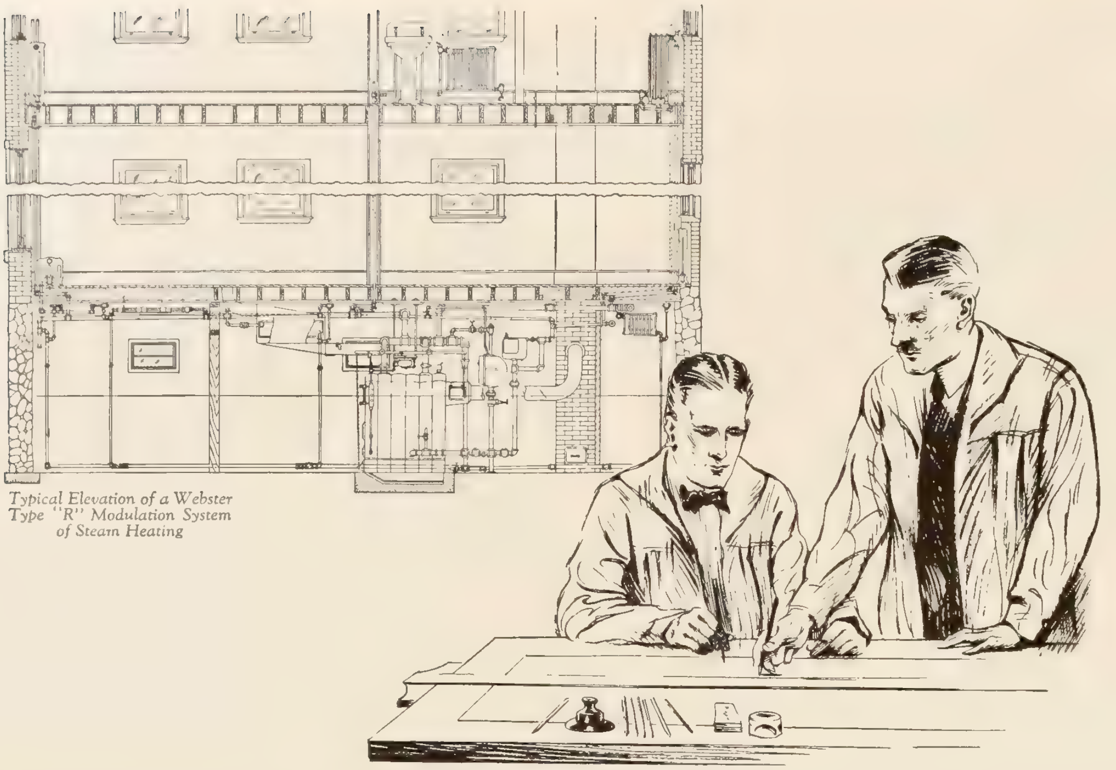

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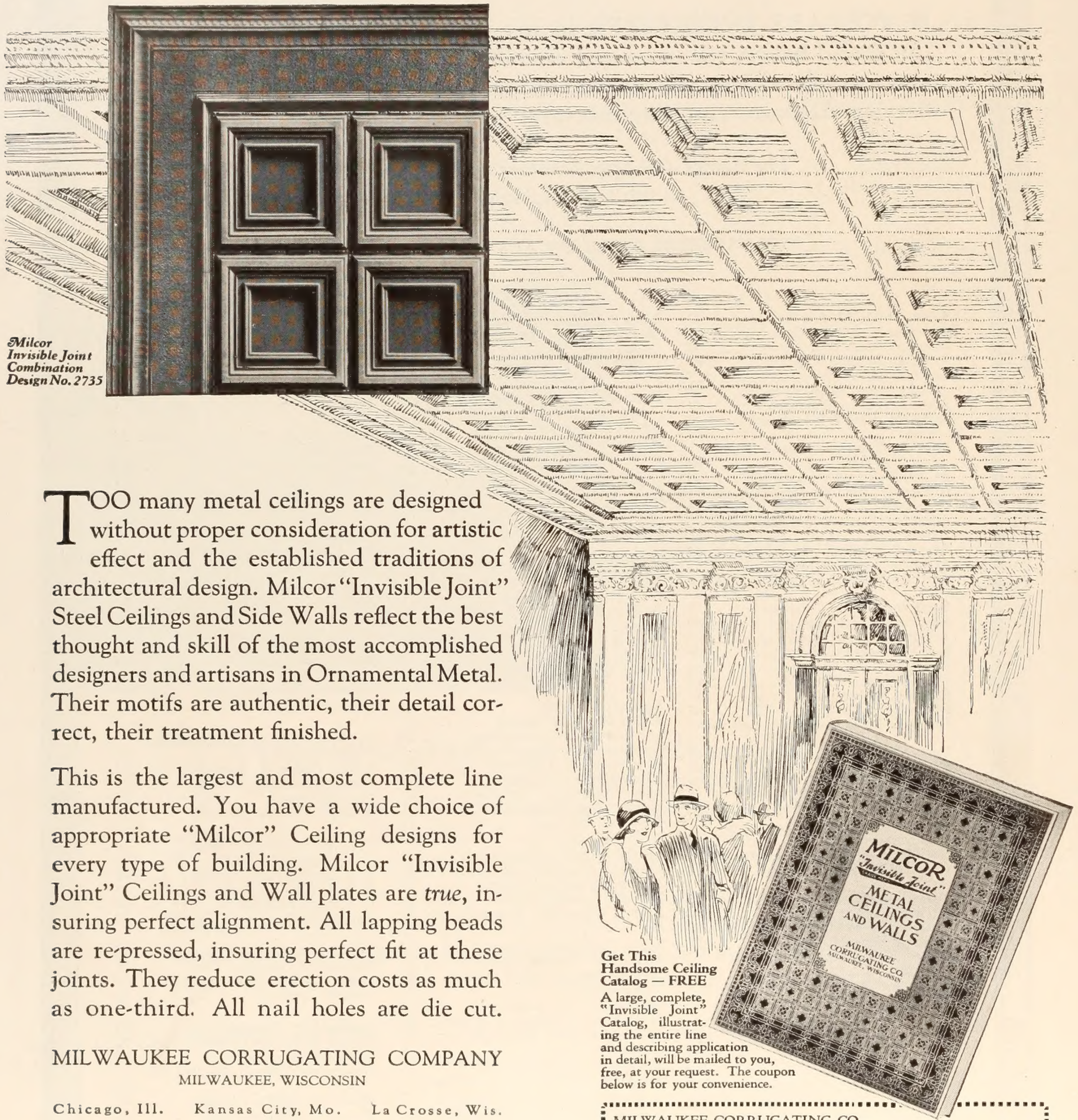
Kelsey Heating Company	*17*
Kerner Incinerator Company	*20*
Kewanee Boiler Company	*3*
Kewaunee Mfg. Company	*65*
Kimball Mfg. Company	*54*
King Construction Company	*67*
Kinnear Mfg. Company	*77*
Kohler & Company	*39*
Lord & Burnham Company	*8*
Louisville Cement Company	*29*
Ludowici-Celadon Company	*49*
Lupton's Sons Co., David	*38*
Lutton, William H., Company	*73*
Major Equipment Company	*93*
Manhattan Terrazzo Brass Strip Co.	*66*
McCabe Hanger Mfg. Company	*72*
McKeown Bros	*73*
Miller, G. L., & Company	*44*
Milwaukee Corrugating Company	*98*
Minneapolis Heat Regulator Company	*11*
Mississippi Wire Glass Company	*70*
Moulding, The Thos. Brick Company	*82*
National Floor Tile Company	*71*
National Radiator Company	3d Cover
National Terra Cotta Society	*37*
Nelson, Herman, Corp	*50*
New England Granite Company	*57*
New Jersey Zinc Company	*18*
Norton Company	*26*
Pittsburgh Reflector Company	*85*
Portland Cement Company	*16*
Prometheus Electric Company	*71*
Rackle, George, & Sons Company	*56*
Raymond Concrete Pile Company	*7*
Read Machinery Company	*79*
Reading Iron Company	*14*
Richards-Wilcox Mfg. Company	*35*
Robinson, Dwight P., Company	2d Cover
Royal Ventilator Company	*75*
Ruud Mfg. Company	*86*
Samson Cordage Company	*64*
Sanymetal Products Company	*75*
Sedgwick Machine Works	*68*
Smith, H. B., Company	*25*
Smyser-Royer Company	*81*
Speakman Company	*74*
Standard Electric Time Company	*68*
Structural Slate Company	*19*
Sullivan Granite Company	*69*
Tareyton, Herbert (American Tobacco Company)	*43*
Taylor, Halsey W., Company	*76*
Thatcher Company, The	*79*
Toch Brothers	*75*
Trenton Potteries Company	*46*
U. G. I. Contracting Company	*6*
U. S. Gypsum Company	*1*
U. S. Mineral Wool Company	*70*
U. S. Radiator Company	*83*
U. S. Rubber Company	*27*
Universal Safety Tread Company	*72*
Vendor Slate Company	*89*
Ventilouvre Company, The	*28*
Vermont Marble Company	*67*
Vitrolite Company	*45*
Wagner Mfg. Company	*84*
Wallace & Tiernan Company, Inc.	*92*
Warren Webster Company	*94*
Weatherbest Stained Shingle Company	*79*
Weis, Henry, Mfg. Company	*76*
Western Brick Company	*70*
Western Pine Mfrs. Ass'n	*22*
Westinghouse Electric Company	*23*
Williams, J. W., Slate Company	*87*
Wilson Corp., The J. G.	*81*

METAL CEILINGS OF REAL ARTISTIC MERIT



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TOO many metal ceilings are designed without proper consideration for artistic effect and the established traditions of architectural design. Milcor "Invisible Joint" Steel Ceilings and Side Walls reflect the best thought and skill of the most accomplished designers and artisans in Ornamental Metal. Their motifs are authentic, their detail correct, their treatment finished.

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MILCOR

PROGRESS

A Brief Outline of the Thirty One Years of Progress In Radiator Manufacture

THE Aero Radiator, made in three patterns—Three, Five and Seven Column—and fourteen heights, was introduced about four years ago. Today millions of feet are warming buildings of all types and character throughout the United States, Canada and Foreign Countries.

Until this radiator was introduced, very little, if any, improvement had been made in the heavy, cumbersome and unartistic type of radiator commonly accepted as a standard.

With its restricted air spaces and multiplicity of heights and patterns, the old type of cast-iron radiator was inefficient in operation and difficult to adapt to heating demands both from manufacturing and installation standpoints.

Progress in warming buildings and in warming methods demanded a more simplified, artistic and efficient product. National Radiator Company engineers recognized that a new line of radiators embodying these qualities would become a radiator vogue. The Aero Radiator was designed and introduced and is consequently the first complete line of modern cast-iron radiators placed on the market in many years. The National Radiator Company was the first manufacturer to offer such a line of improved radiators to the user at the same price as standard radiation.

That it is a distinct improvement over the old standard cast-iron radiator is attested by the tremendous demand for it by architects, engineers, owners and the trade. No other radiator has ever created the same furore and it in type will unquestionably become the radiator standard of the future.

Artistically designed, with slender, graceful lines and beautiful proportions, the Aero Radiator adds rather than detracts from interior furnishing. Its three patterns and fourteen heights also provide just as complete an assortment of sizes for all types of heating installations as the old cast-iron radiator with its many patterns and sizes.

The National Radiator Company, many years ago, recognized the demand for a simplified radiator line. At that time they discontinued the ornamental type and standardized on the plain. This, later was adopted by all manufacturers.

The National Radiator Company was the first radiator manufacturer to perfect and standardize on the Malleable Cast-Iron Push Nipple. The Push-Nipple radiator connection, when Malleable Cast-Iron Push Nipples are used, has demonstrated by years of use to be not only a permanent one, but the only truly mechanical one.

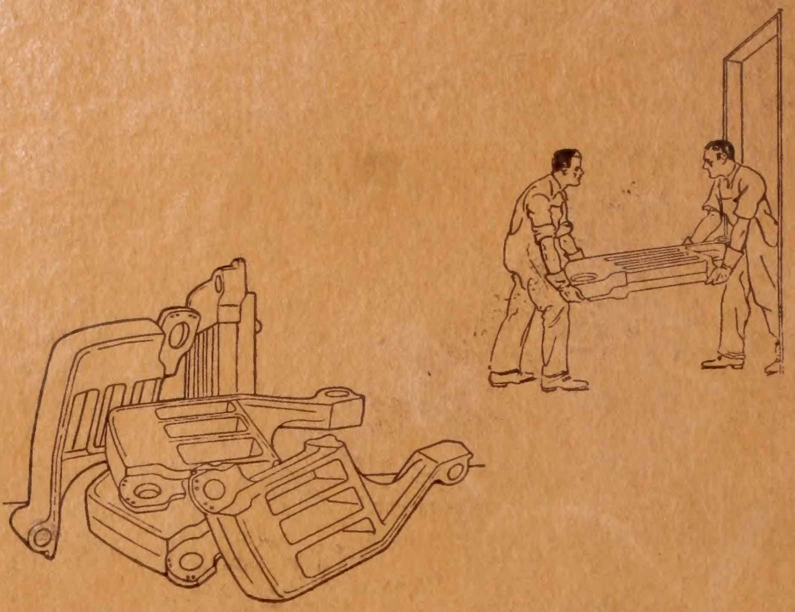
It is the constant aim of National Radiator Company Engineers to keep abreast of the times in their product. The many improvements and innovations they have made are all assurance that National Products will be constantly improved as the necessity arises.

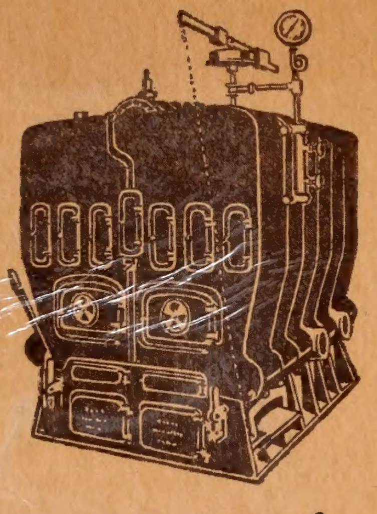
NATIONAL RADIATOR COMPANY
JOHNSTOWN, PA.

PLANTS: Johnstown, Pa., New Castle, Pa., Trenton, N. J.
BRANCH OFFICES: New York, Philadelphia, Baltimore, Washington,
Richmond, Pittsburgh, Cincinnati, Cleveland, and Chicago

BEAUTY *and* WARMTH *with*
AERO RADIATORS

THE SCRIBNER PRESS





Goes Through A Narrow Door

THERE isn't any part of the Big Burnham Twin Section Boiler that won't go through an opening that's a foot wide.

Big as it is, it can be installed at any time without any tear-outs.
Its advantage in replacement jobs is apparent.

For low pressure heating it costs less and performs more economically than steel tubulars.

This is a statement we can make without being accused of knocking, as we make both cast-iron and steel boilers.

The Big Twin Burnham is made in 7 sizes, and will heat from 7,850 to 16,550 feet for steam, and from 12,600 to 27,000 feet for water.

There are eight members to The Burnham Family of Boilers. Each made for a particular place or purpose.

Burnham Boiler Corporation

Irvington, N. Y.
New York Office, 30 East 42nd Street

Representatives
In all Principal Cities

Canadian Offices
Harbor Commission Bldg., Toronto
124 Stanley Street, Montreal